THE *Heart* OF LEARNING

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SINGAPORE UNIVERSITY
OF SOCIAL SCIENCES

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Foreword

"The Heart of Learning" – Commemorating the transformation of UniSIM to SUSS, 2017.

This book was conceived during a wave of anti-globalisation fervour in the Western world, expressed through a series of political events including Brexit, the election of Donald Trump as President of the United States, and high anxiety in Western Europe about the rise of far-right political parties in the Netherlands, France and beyond. As this book's manuscript was being finalised, the geopolitical situation appeared to have settled somewhat; or in the parlance of market economists, these events and possibilities had somehow been "factored in", and the world had moved on. The recent election of Emmanuel Macron as President of France in May 2017 over his nationalist opponent Marine Le Pen brought further relief to those who believed in liberal democratic values and the global market economy. It seemed that the existing regime would not topple after all. Free trade, financial capitalism, open borders, would all continue, although they would no longer be put on a pedestal.

Nevertheless, the challenges of globalisation remain. Although the globalisation of the twentieth century has brought hundreds of millions of people around the world out of poverty, it has also caused huge dislocations in social and economic lives and precipitated severe income and wealth inequalities. Accompanied by rapid technological advances in recent decades, the world is experiencing great uncertainty, felt at both the individual and community levels. Painful disruptions brought by technological advancement have occurred before, but the speed and the scale of the current 4th Industrial Revolution are unprecedented. There is now a pervasive fear and anxiety among the working and middle classes, as the benefits of efficiency and automation are seen to be concentrated in the hands of the wealthy few. Upward social mobility — hitherto a pillar of social stability — is being diminished.

Technology itself does not lead to war, conflict, or revolution. It is the social organisation of technology and the distribution of its rewards that lead to disruption, inequality and discontent. The way technology is developed and harnessed is therefore crucial to the advancement of world peace and stability. It is the way that we interact with technology and utilise it for social purposes that enables the enhancement of human well-being.

In academia, the broad disciplines of the Social Sciences have long served as the anchor of economic, political, and social policies. Together with the Humanities, these disciplines have incubated many great leaders of the world, past and present. However, the importance of the Human and Social Sciences has not always been acknowledged locally, with other disciplines often taking centre stage in the educational landscape.

This is why the establishment of the Singapore University of Social Sciences (SUSS) as the 6th autonomous university is a highly significant event for higher education in Singapore. In my mind, Singapore's ideology of pragmatism must be steeped in the knowledge of what works and what does not work in human society. This is the unique contribution of the social sciences. Having seen and personally participated in the development of these disciplines over the past five decades, I can truly say that the time for recognition of the social sciences in Singapore has arrived.

The scope of the potential contribution by SUSS is great, given the prospect of slower economic growth as Singapore's economy matures. Many of our society's most pressing issues can be conceptualised and addressed by the social sciences, such as our ageing population, rising aspirations for a higher quality of life, globalisation of work and population mobility, changing family and socio-cultural values, environmental sustainability, national security and resilience issues, and more.

At the same time, the University has a huge responsibility to teach social sciences in the right way, by holding up high academic standards, proving the practical relevance of various fields, and providing a sound framework (including knowledge, skills, and values) for the graduates' engagement with societal issues. Sound knowledge, research methods and analytic skills are particularly important in this day and age, when many have misappropriated concepts and language from the social sciences. Such practices are rife in sensationalist popular culture, social media, and in "populist" political discourse.

This book collects perspectives from SUSS faculty on facing the challenges of a fast-changing world. Inter-disciplinary and experiential approaches, rooted in the social sciences, are the University's unique contribution, and I am confident that this will enable our students to gain a worthwhile, holistic education, and ultimately to make a difference to society.

At the Heart of Learning is the human purpose. Herein lies the social mission of the University.

I wish SUSS a shining future!

Aline WONG
Chancellor
SUSS

Singapore University of Social Sciences

Neelam AGGARWAL

A purposeful journey, blazing a trail,
Upwards and onwards, a will to prevail;
Touching lives, shaping futures, a social mission,
Ceaseless learning, an unwavering vision.

Changing landscapes drawing forth new exploration,
Profusion of choices, personal and social edification;
Expanding horizons to embrace globalisation,
Real-world issues, social needs, ageing population.

Developing habits upright, inspiring motivation,
Head, heart, a will for rigorous application;
Serving society through applied orientation,
Having robust, ethical, exemplary dedication.

Upwards and onwards, the journey resumes,
New demands to meet, professionals groomed;
Shaping a better nation, scaling new heights,
A tomorrow better, with fresh new insights.

Contents

Chapter 1

Introduction: Why We Do What We Do

LEONG Thin Yin and CHEAH Horn Mun

Background

The workforce in advanced economies has been trying to cope with dynamic changes brought about by economic growth and scientific advancements. These changes pose new challenges for private and public sector organisations, training institutions, and government agencies responsible for designing policies that promote lifelong learning, skills upgrading, and self-directed learning.

The book is organised into four sections: *Post-Brexit World, Societal Needs, University Education, and Lifelong Learning*. Each section sets the stage for what is happening in our world today, the challenges faced in our community and society at large, the impact of university education now and beyond, and how it should be broadened to support learning as a lifelong habit.

This overview of the educational approach of the Singapore University of Social Sciences (SUSS) reinforces the role it seeks to play in the evolving tertiary education landscape by incorporating different approaches and activities into the *Heart of Learning* of the University.

Post-Brexit World

The opening section provides the socio-economic context, background, and framework for later sections. It touches on key concerns facing our world today such as social policy, globalisation, economic and technological changes, and specific skills training settings and provisioning.

These concerns arise from policies and ideologies governing technological advancement and economic globalisation. While these have brought about strong economic growth, they have also contributed to severe recessions, such as the dot com meltdown in 2001 and the 'great recession' in 2008-2009. Despite significant wealth generation over time, it has been distributed in a manner that has increased economic inequality. Credit Suisse has estimated that the bottom half collectively own less than 1% of total wealth, while the top 10% own 89% (Kersley & Koutsoukis 2016). Increasing income inequality has been correlated with a range of social issues (Wilkinson & Pickett 2009) which require urgent policy attention.

Technological advances have also been contributing to a sense of uncertainty and job insecurity. Technological disruptions and innovations are, by themselves, broadly desirous given the potential positive changes in the quality of human life they bring about. However, without policies that can translate the efficiencies associated with new technology into actual enhancements of life, the relentless pace of change can be disorienting at best, and debilitating at worst. For instance, the productivity gained through technologies has accrued disproportionately to the top income earners, exacerbating the pressure already felt by workers where technologies replace their work.

On the whole, technology trends and economic history indicate that disruptions are not new and will continue to impact our lives in different and unexpected ways. We must strive to gain a deeper understanding of the impact of technologies in our lives, so that its influence can be more effectively addressed.

Societal Needs

The speed of technological and economic change means that the need for greater community-building and the forging of stronger human connections is greater than ever. These connections need to be diverse and built on a common vision of upholding the well-being of all members of society. In many places, the fabric of society is being stretched, in many cases to a breaking point, because social divisions are not being properly addressed. This section explores important dimensions of these changes and possible responses that can mitigate the impact.

Some argue for instance that a wider range of policies that support community-building, particularly through developing acceptance of pluralistic neighbourhoods, are important for social cohesion. The situation is particularly challenging in advanced economies facing an ageing population. Given that our resources are finite, the response to a rapidly ageing society cannot just be targeted at increasing the birth rate. Responsible consumption of resources has to play a part in addressing this issue. In the near future, perhaps technologies can offer a sustainable way forward. Meanwhile, the challenge is to enable the ageing population to effectively handle the changing circumstances, all while living a full and meaningful life with dignity.

The complex forces bringing about changes in social interactions need careful managing so as to avoid unnecessary social upheaval. In fact, the potential for civil unrest along racial, religious, and social status lines is all too real. This could usher in open conflict in their various forms, including the presence of 'terrorist' activities To face such challenges, it is not sufficient to rely only on governmental efforts, even if the governments concerned are competent enough to handle them. It requires a collective effort involving governments, communities and the private sector to build societies that are conducive to human development.

In attempting to build social cohesion and resilience, a very good place to start is with education, particularly early childhood education. Education not only builds competencies that equip individuals with life skills so they become full members of society, it also provides a platform to enable the learner to embrace inclusive societal values. Education is, of course, a collaborative effort that promotes organisational excellence and new ways of thinking about a wide range of social issues. Examples include the future of public transport, labour productivity and workplace safety, and the training of future lawyers.

University Education

University education is generally perceived as the highest attainable level of formal learning for an aspiring individual in the modern era. It also represents the necessary preparation for the learner to access higher status and better paying jobs, thus providing a measure of social mobility. As such, most parents, wishing for their children to move ahead in life, devote considerable resources to ensuring that their children receive a university education. With the advent of technologies making learning accessible to a wider population, as well as the shift in the importance of practice-based learning, university education is increasingly seen as not being as central to employment preparation.

It is, therefore, pertinent to examine what constitutes an education in today's changing world. Indeed, the focus of higher education needs to be expanded to include learning

that exposes students to non-academic dimensions. These provide for life-skills that are just as important, if not more so, than academic development. Such skills can be provided through community service and service-learning that produces a better balance of learning between academic and life-skills.

Another facet of university life not easy to measure is the influence that university instructors with rich professional, work-place and life experience can bring to the classroom. The tendency of most institutions is to employ full-time teachers, who other than having undergone similar educational programmes or conducted theoretical research, to develop courses and teach undergraduates. More emphasis in university education should be placed on what is practical, yet based on sound theory and general applicability.

Of course, a university education cannot simply abandon what have been progressively built up over the years. Subject matter courses were developed from a body of knowledge based on academic research. These courses, which have been carefully selected to form a university curriculum, will remain the intellectual core of academic degrees. However, with dynamic changes in our world, academically sound and rigorous models and methods should be challenged to ensure they remain relevant so that they can be correctly and appropriately applied. Moreover, the focus of the workplace increasingly revolves around collaboration, team-work, and group decision-making. The leader in the team is not the one with the job title but the one who takes practical steps to promote outcomes, including influencing others to come on board.

Lifelong Learning

In a knowledge-based and technology-enabled society, a good portion of what is learnt in formal education can quickly become obsolete as the needs of the economy change. Lifelong learning, as the term suggests, is a viable response to the rapid attrition of knowledge. It implies the need to imbue a mindset with corresponding skills to continually engage in learning throughout the individual's life. Such a mindset, albeit not new, signals a paradigm shift necessitated by current realities. It points to the ability to continue to learn and apply the learning effectively as essential for economic survival.

The lifelong learning landscape is given further impetus through the presence of technologies that allows the learner to access a wide range of knowledge relatively easily. While this provides considerable empowerment for the learners, the scaffolding of such learning becomes even more important for formal educational institutions, particularly the universities. Thus, the learner not only needs to acquire the desired knowledge, he or she also needs to be able to access well-constructed learning experiences. Therein lies the rub for universities.

The modern university will need to take into account both the formal and informal learning that students can access. This is not just a technological accessibility issue. More importantly, the pedagogical approaches for both can be distinctly different, and require considerable effort to ensure that the university remains supportive of student learning while at university and after graduation.

The problem with modern technology is that it has made information too readily available, and much of what is posted on the Internet may be deceptive, dubious, and even plainly untrue. The uninformed may inadvertently be cherry-picking knowledge that pleases them, and society may end up being misinformed or deceived. The proper and effective dissemination of information and knowledge becomes important, which is why services like Wikipedia with its built-in mechanism of open review and editing remains relevant and useful.

In the past, knowledge was disseminated from one generation to the next. Today, with knowledge advancing quickly and society evolving along with it, what was once relevant and useful may not be so any more. Moreover, what was deemed to be high-level knowledge in the distant past has become basic knowledge learned in primary school. What is perhaps sobering to note is that knowledge acquired in formal education can be disconnected from the skills needed in the workplace. While it is very difficult to ensure that the link between theory and practice is coherently integrated within a formal curriculum, the use of various approaches can help to shape mindsets and allow the learners to develop a flexible skill set amenable to future learning and turning theory into practice.

In this, design and computational thinking is proving increasingly useful in everyday life. It does not mean that the graduate must be multidisciplinary at graduation. Rather, what is desirable is that graduates must know that they need to work with others with different frames of reference and be prepared to learn beyond their narrow fields of expertise. A further illustration can be seen in Fintech, which provides a means for the average person to participate in the financial market and is poised to change the world in other ways as well.

Singapore University of Social Sciences

The Singapore University of Social Sciences has encapsulated its governing ethos in the "Head, Heart, Habit" mantra. All the programmes and courses are well founded in their respective academic areas. The development of the curriculum often incorporates industry inputs to ensure it remains relevant and practice-oriented. In fact, the delivery of the curriculum often involves the employment of instructors with relevant work experience,

industry consultancy, and project collaborations. These constitute the "head" component of our governing ethos.

To nurture the "heart", the University requires all full-time students to complete community-based group service-learning projects and to spend time overseas. These experiences will help ensure students learn to become self- and others-aware, and have a better sense of what it means to sacrifice individual interest for the good of the community. In combination with outdoor learning experiences, students learn to face their fears and self-doubts, to build resolve and even champion causes for deserving issues, such as displaced people, abused animals, and the environment. This approach transcends merely learning about "social consciousness", by creating 'volunteers for life' among students. They are encouraged to excel not just academically, but with a spirit of caring for others. To recognise and encourage this, SUSS annually presents the SPIRIT award to deserving students nominated by their peers or instructors for demonstrating strength of character and service to others.

Finally, "habit" refers to helping students take personal responsibility for their learning. In a world where change is the only constant, students must develop both the attitude and aptitude for self-study and continual upgrading of skills. Self-reliance helps a person prepare for personal and professional challenges. We strive to prepare our students not only for the jobs of today, but also for the jobs and life responsibilities of tomorrow. The University's curriculum places emphasis on self-directed learning. By placing the onus for learning on the student, we encourage each of them to lead and direct their own education, laying the foundations for continued learning throughout life.

SUSS recently consolidated its position as a national leader in online learning with *UniLearn*. Through this open learning platform, specially selected SUSS courses are made available, free of charge, allowing everyone the opportunity to continue learning. Complementing our full-time and part-time study programme offerings, *UniLearn* further enables self-directed learning in our society.

The SUSS approach to university education is significantly different from more traditional universities, where the common approach is to admit school leavers only and graduate them upon completion of their degree programme. In a rapidly changing world, the undergraduate may soon find that the study programme and its curriculum are no longer relevant as the world has shifted course. Even professional fields, like medicine and law, could find that infocommunication technology and artificial intelligence may alter their scope and practices. A programme that not only recognises this challenge but strives to keep the learning up-to-date represents a worthy challenge to university education.

Organisations that do not change of their own accord will be changed by events beyond their control. We can either shape our own destiny, reinvent ourselves if needed and come out stronger, or be buffeted by the forces of nature and suffer possible extinction. This applies to everyone of us.

Just as it takes a village to raise a child, it also takes the larger community to produce a world-ready university graduate. SUSS has been able to do what it has because of the generous support of the Singapore government, labour unions, industry partners, employers, and most of all, the relentless "never say die" attitude of its students, associates, staff, and faculty. Cheers to them all!

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Post-Brexit World

Chapter 2

Skills Training, Technological Change, and the Income Gap

LEONG Thin Yin, Randolph TAN Gee Kwang and LIM Tai Wei

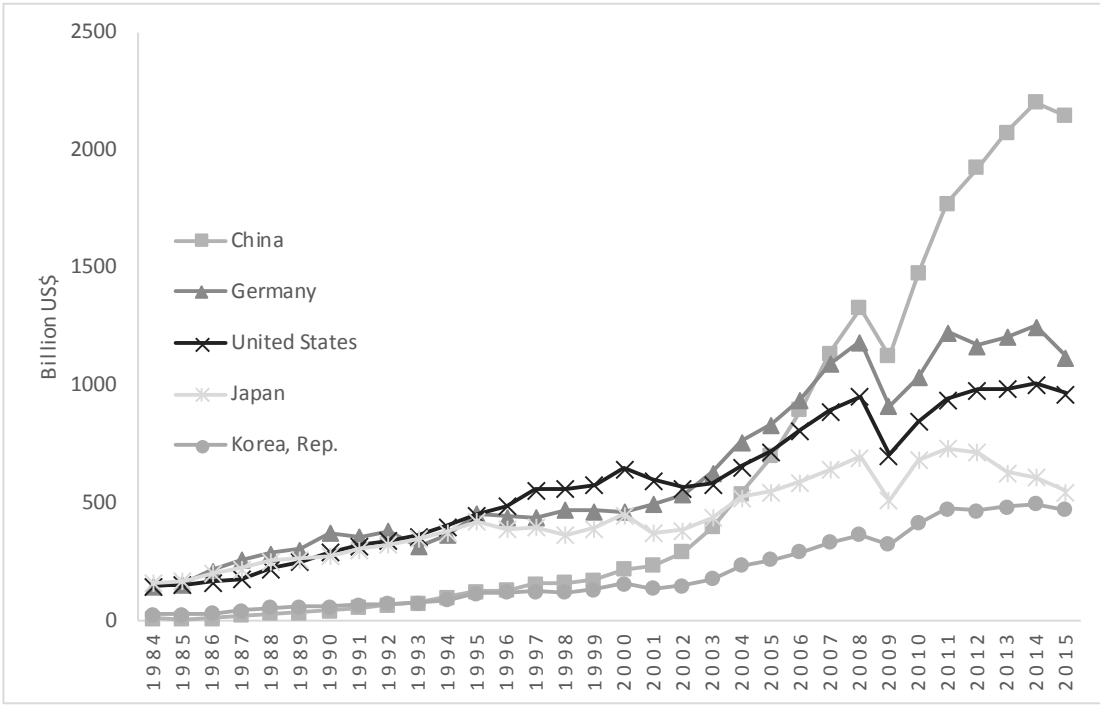
Introduction

Rapid globalisation and technological development followed the Cold War. Full employment was challenged by the collapse of former socialist economies, and later, the rise of emerging economies in the global economy. This channelled large numbers of low-wage workers into manufacturing. Simultaneously, technological progress enabled the use of robots and software that could exceed humans in productivity. For example, industrial robots started replacing human workers in car spray painting (due to highly-hazardous paint) and vehicular welding in the 1990s.[1]

The most important source of change that emerged during the 1990s was China's influence on global trade. The reasons for China's tremendous impact as an emerging economy were 1) the speed at which its dominance in export-led manufacturing was achieved, and 2) the magnitude of its lead was reinforced by technological advances of that period. In 1984, China accounted for a mere 1.1% of total manufacturing exports in the world (refer to Chart 1). This was equal to Singapore's, but paled in comparison to Japan's 14.3%, which at that time, was the world leader in manufacturing exports.

1 Gordon RJ 2016. "Jobs Are Under Attack, But Not by Robots", Bloomberg, 27 Jan (https://www.bloomberg.com/view/articles/2016-01-27/jobs-are-under-attack-but-not-by-robots).

Chart 1. Manufacturing Exports: Top Five in 2015[2]



In 1997, when the U.S. became the leader in manufacturing exports, its global market share was 13.4%, only slightly above the 13.2% it accounted for in 1984 when it was behind Japan. By that time, China's share of the world total had already grown to 3.8%. In 2015, as the world's top exporter of manufactures, China's share expanded to 18.7%. Between 1984 and 2015, China's share grew 16 times, while the U.S.'s fell by more than a third. Although China may not have been the source of the Fourth Industrial Revolution, the magnitude of the changes provides a very compelling picture of where the momentum came from.

Advent of Technology

Nowhere is the debate on workforce skills deficits and technological disruption more intense than in the growing use of robots in industry. This puzzling issue has surfaced in the world's manufacturing powerhouse, China. Singapore's Finance Minister Heng Swee Keat felt strongly enough about this seeming contradiction to point out that the largest purchases of industrial robots were occurring in "the country with the most people in

2 World Bank 2015. World Development Indicators (http://databank.worldbank.org).
3 Ministry of Finance 2016. Budget Roundup Speech. Parliament of Singapore, Apr 6.
4 Peter Gorle and Andrew Clive 2011. "Positive Impact of Industrial Robots on Employment", Metra Martech, 21 Feb (http://www.metra-martech.com/).

the world. It is astounding, is it not? So, if even China, at their lower level of wages, is automating, what does this mean for us?"[3] In spite of arguments that new technologies can lead to new job creation,[4] Brynjolfsson and McAfee (2012) highlighted a study that showed that technological change was displacing jobs faster than it is creating them.[5]

In 2015, Chui, Manyika, and Miremadi demonstrated that technologies in use today could mechanize 45% of the work that humans are employed to do, and approximately 60% of all positions in the workplace could have at least 30% of their assignments mechanized with current technologies.[6] According to them, automation, machine learning and robotics can have an impact reaching beyond manufacturing, altering other sectors such as healthcare and finance. These postulations were based on the percentage of time used for activities that can be automated using the technologies available today (the article does not factor in pace of economic growth).[7] BBC News projects that 1.3 million industrial robots will be deployed globally by 2018, while the World Economic Forum points out that by 2020, robots will replace 5 million jobs in 15 important economies worldwide.[8]

To see where the growth in robots is focused, it is necessary to examine high technology exports (refer to Charts 2 and 3). All the top-ranked exporters of high-technology manufactures are major buyers of industrial robots. More interestingly, analyzing the 1993 to 2007 robot density data from Graetz and Michaels (2015),[9] Randolph Tan observed that the increase in the current value of exports of high-technology manufactures is correlated with the increase in the density of use of industrial robots. The straight line depicted in Chart 3 captures the positive relationship between the value of high-tech exports and the use of robots in selected countries, where D(#robots/H) is the derived change in the number of robots per million hours worked, a measure of the change in robot density.

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5 MIT's study reported in Rotman, David 2013. "Business How Technology Is Destroying Jobs", MIT Technology Review, 12 Jun (https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/).

6 Chui M, Manyika J & Miremadi M 2016. "Where Machines Could Replace Humans—and Where They Can't (Yet)", McKinsey Quarterly, Jul (http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet).

7 Ibid.

8 BBC News 2016. "The Robotic World is a Reality for Many Industries", BBC News, 21 Jun (http://www.bbc.com/news/business-36583237).

9 Graetz G & Michaels G 2015. "Robots at Work", Centre of Economic Performance, Discussion Paper 1335, Mar, London School of Economics and Political Science (http://cep.lse.ac.uk/pubs/download/dp1335.pdf).

Chart 2. High-technology exports: Ranked by 2015 Value[10]

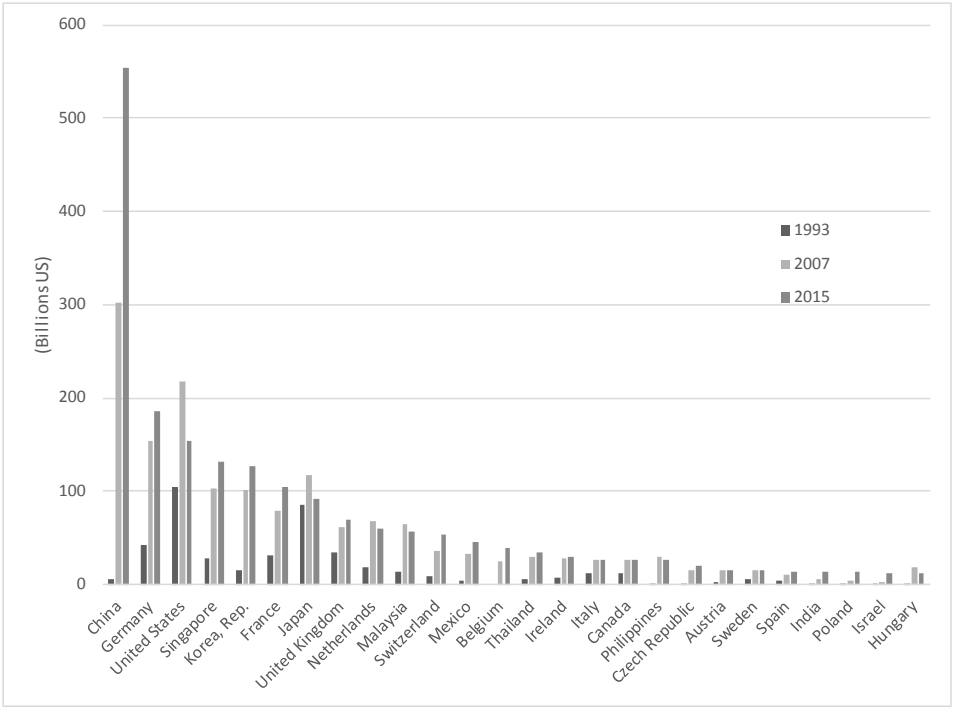
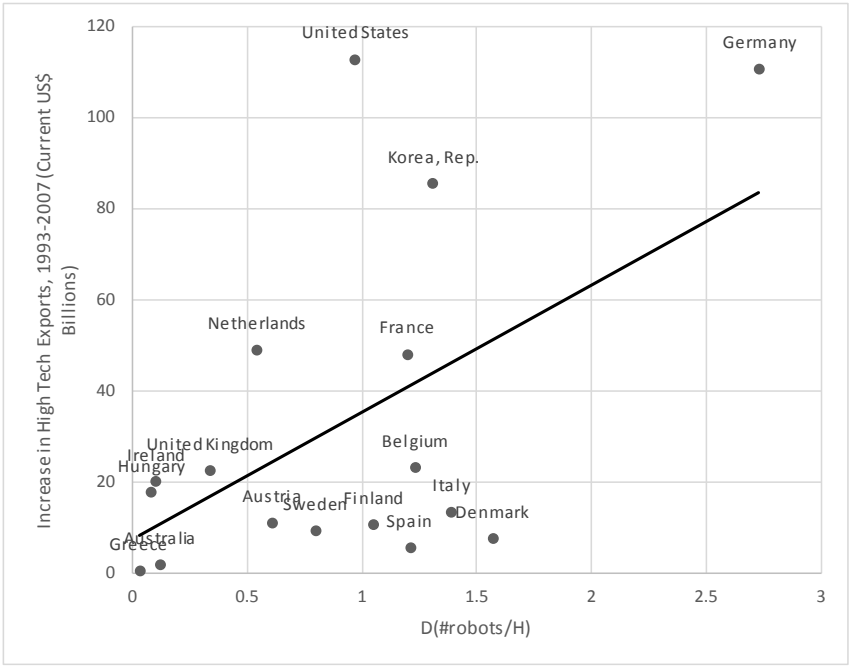


Chart 3. Increases in high-technology exports versus use of industrial robots in selected countries.



10 Ibid.

Artificial Intelligence

Another major technological development with the potential to reshape the workplace is Artificial Intelligence (AI). With the development of AI, machines can learn to become more effective in performing work assignments. Swap and Leonard (2014) interviewed leading Chief Information Officers, Chief Technology Officers and high ranking executives about the impact of AI in the modern industry. The question posed to them was the extent to which "critical, experienced-based knowledge could be captured and codified through technology" versus dissemination to others "through direct experience", and the responses were 71% believe experienced-based knowledge can be partially codified through AI and related technologies, and 4% believed that it can almost completely be codified.[11]

One prescription for managing such changes has been workforce skills training and retraining. However, the mode of instructions, teaching format and the kinds of skills needed have evolved alongside changes in the external environment. These developments have changed the way humans interact with technologies, and responses have ranged from the need to manage automation and upgrade skills to leverage technological advancement, to having one's skills and knowledge completely replicated by machines and robots that learn from human processes.

In some cases, the process may end up in complete occupational replacement by machines (e.g., licensed taxi drivers first replaced by Uber drivers and then eventually by driverless vehicles). Another example where the displacement has occurred is in the mining industry where driverless trucks and trains have been used for some years now at mining sites and in transporting the ore from the mine to the port. But, like other implementations of cutting-edge technologies, this development should not be overstated. There are still outstanding problems that need to be resolved.

In Australia for example, 68,000 cab drivers protested that Uber introduced unfair competition, because taxi regulations and licence fees made cab fares more expensive.[12] Technologies no doubt can lead to inequity, yet that surplus formerly captured by producers can enhance social welfare when transferred to consumers. In addition, Australian passengers claimed that Uber empowers them as the technology allows them to "estimate fares and car arrival times, view the approach of a driver, monitor actual versus advised routes, streamline payments, and review each trip's route, time, driver, and fare".[13] As an online service, Uber has substantially globalised the transportation and logistics market.

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11 Swap W & Leonard D 2014. "Artificial Intelligence Can't Replace Hard-Earned Knowledge – Yet", Harvard Business Review, 17 Nov (https://hbr.org/2014/11/artificial-intelligence-cant-replace-hard-earned-knowledge-yet).

12 Jericho G 2016. "The Dark Side of Uber: Why the Sharing Economy Needs Tougher Rules", The Guardian, 18 Apr (https://www.theguardian.com/business/grogonomics/2016/apr/18/uber-airbnb-sharing-economy-tougher-rules-australia).

13 Ibid.

Driverless cars may remove humans from driving, but implementation remains problematic at present. Google, a global leader in this technology, has encountered problems. For example, during an experiment in 2009, a Google driverless car was unable to resolve its navigation through a four-way junction because its sensors stopped the car to wait for other human-driven cars. There have been other challenges in experiments pertaining to driverless cars, but the pace of technological development is likely to continue unabated, given exponential gains in the fields of AI, robotics, and digital software applications (apps). In the future, humans will need to adapt to self-aware AI systems.

US as a Case Study

Since the 1990s, the capacity of technological change in making skills obsolete has grown considerably. Regardless of where one stands on the debate about job losses, it is important not to overstate the impact simply because technological changes can also give rise to demand for new skills that only humans can do. (The idea that technology produces a "derived demand" for new work and jobs is nothing new. The most dramatic example of it is the surge in female labour force participation post-WW2, which would not have been possible without new jobs becoming less physically onerous.) Therefore, the strategy for the workforce and other economic stakeholders is to adapt and meet the demands for such new skills. Strategies to manage technological changes were adopted even before the 1990s, and these included retooling and retraining to ensure the workforce is well equipped to cope with workplace changes.

At the end of the 1990s and in the first decade of the 21st century, American companies started to practise what was then known as workforce "churning" — "laying off employees with obsolete skills and replacing them with workers offering newer skills".[14] The main implication of "churning" is that gaps between higher and lower skilled workers was fast becoming a priority in retaining employment in US-based companies and firms. Global economic structural changes alerted leading corporations to the importance of constant retraining to refresh skills in order to remain competitive in the global economy.

By the late 1990s, America had undergone two decades of corporate restructuring, putting an end to most stable fulltime jobs or any promises of lifetime employment (LTE) by large corporations. The conventional approach amongst a third of all American companies at that time was to retrench workers without the requisite skills and hire those with a better skill set.[15]

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14 Knowledge@Wharton 2003. "Why Some Companies Retrain Workers, and Others Lay Them Off", Wharton, 29 Jan (http://knowledge.wharton.upenn.edu/article/why-some-companies-retrain-workers-and-others-lay-them-off/).
15 Ibid.

To minimize disruptions to the workforce, the proposed solution was to internalize restructuring by retraining workers instead of firing them, obviating the need to hire new recruits who may have to spend their own resources acquiring new skills.[16]

Human and Social Capital

Social capital has been touted as a reason for not firing workers due to skills deficit; companies are urged not to disrupt the tight intra-firm network of workplace relationships. Colleagues who work and collaborate with each other end up knowing a lot about each other,[17] and build a delicate ecosystem easily disrupted by excessive hiring and firing. Therefore, it was important to keep this ecosystem intact as far as practicable. Cappelli (2003) argued that even when employees' skills become obsolete, the accumulated social capital in relationships, knowledge and familiarity with colleagues may make it more efficient to retain and retrain so that acquired social capital remains intact within the company and relationships that take time to build can be preserved.[18] It often costs less to the company to internalize training needs and costs by designing programmes with training institutions, minimising hidden costs of reconfiguring project teams caused by disruptive personnel changes.

Of course, skills training can also boost human capital. The Organisation of Economic Cooperation and Development (OECD) states that investments in human capital can encourage economic growth and fairer distribution by enhancing skills to improve employment opportunities, promote social inclusion, better income and manage social injustice.[19] To maximize resources, human capital investments are made more precise and targeted. By the start of the second decade of the 21st century, skills deficit in certain types of occupations had begun to emerge and a different set of specific training needs was promoted.

Instead of retraining whole batches of workers in industry sectors, a core group of skills missing in the developed world were identified. This skills sector — also known as "middle-skills jobs in computer technology, nursing, high-skill manufacturing, and other fields — require postsecondary technical education and training and, in some cases, college math courses or degrees".[20] These were jobs not out-sourced, under-staffed by local citizens in the developed economies, and not completely replaceable by technologies. Middle skills jobs are relatively well-paid, generating employment at a time of mature or slower

16 Ibid.
17 Ibid.
18 Ibid.
19 Taylor K 2012. "Why is Human Capital Important for Development?", Organisation for Economic Co-Operation and Development, 26 Apr (https://community.oecd.org/docs/DOC-41754).
20 Kochan TA, Finegold D & Ostrman P 2012. "Developing Employees Who Can Fix the "Middle-Skills" Gap?" Harvard Business Review, Dec (https://hbr.org/2012/12/who-can-fix-the-middle-skills-gap).

economic growth. However, an important pre-condition for effective implementation of such training programmes is a tripartite collaboration among the private sector, unions and educational organisations.[21]

Middle skills need to be accurately identified with precision by the private sector, which must effectively communicate their needs to training institutions for designing applied skills course modules to address specific skills gap. Adopting a middle skills training programme can create human resources for a new class of jobs for those who are proactive in taking up the necessary training related to the skills needed by employers. Such skills can then be refreshed or learned on the job through afterschool modular courses. In the middle-skills sector, jobs that "require advanced technical and behavioural 'soft/generic' skills (in problem solving, communication, teamwork, and leadership) that existing production and employment paradigms lacked" stand out.[22]

After-school lifelong learning, training and skills modules must be complemented with advanced technical and behavioural skillsets. This will constitute a form of core competency in the university to meet future challenges in the workplace. For greater stakeholder participation in retraining programs designed by the private sector and tertiary education, Kochan, Finegold and Osterman (2012) proposed encouraging multiple employers in the region or industry to pool their resources with training and educational institutions to design and fund programmes to train and hire graduates; combine classroom teaching and theoretical knowledge with skills found in the actual or simulated workplace (most applicable to adult students); and give workers a career, not just skills for the entry job.[23]

Complementary Policies

Together with the skills gap is the income disparity between higher and lower skilled employees. Unlike conventional wisdom that places a premium on skills deficit or mismatch, retraining by itself is not enough. Frick (2014) points out that the challenges lie beyond conventional wisdom, which conceptualizes it as a mismatch between supply and demand, but other factors need to be taken into account, such as white collar pay, corporate governance, and union activism.[24] Institutions and political power, as Frick argues, are crucial in shaping the rules of the economy and the pattern of labour market activities.[25] Institutional structures and rules, as well as political/policy orientations, may limit what skills training can do to address income disparity and wage stagnancy.

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21 Ibid.
22 Ibid.
23 Ibid.
24 Frick W 2015. "Understanding the Debate over Inequality, Skills, and the Rise of the 1%", Harvard Business Review, Dec (https://hbr.org/2015/12/understanding-the-debate-over-inequality-skills-and-the-rise-of-the-1).
25 Ibid.

While education and skills training policies are important, they may not be sufficient to resolve challenges from global structural and technological change. This chapter argues that focusing on productivity augmentation is a prudent policy choice, but it has to be accompanied by a rewards system that provides more equitable returns to workers and employees. The Silicon Valley-type New Economy model is one possibility, where employees are increasingly offered "sweat equity", giving them a stake in the company they work in rather than work for. This will motivate staff to work harder, smarter and more productively, and may even encourage them to upgrade their skills to meet the firm's needs. In some ways, this is nothing new. It dates to the 1980s with the wave of public utility privatisations carried out by western governments (left and right). The motive was to raise revenue to fund key public services. A subsidiary aim was to raise labour productivity by giving workers shares in the utility. It did temporarily, but labour productivity fell again following the initial increase.

Ultimately, this is just one form of rewards for employees as co-owners, but there may be other ways of productive output with regular salaries. Rewards and returns if creatively tweaked may encourage individuals to take up skills training and/or retraining. Another policy complementarity route, TY Leong argues, is to manage rents. Given that rents have become premium in large metropolitan cities, it may be possible for a new social consensus to tune and peg these to a reasonable level determined by forces. Here, a balance may be sought between the needs of different stakeholders for a tenure period of ownership that is reasonable for land and space owners so that rents can be managed to encourage more small-time business owners and entrepreneurs to set up their start-ups and new businesses. If social policies, broad social consensus and skills training initiatives can be harmonized in national initiatives, it may be possible to enhance competitiveness of national economies. Overall, the mode of compensation and business costs in the form of rentals can be shaped by institutional rules and political consensus.

Concluding Remarks

Amidst the emergence of new skills requirement, middle skills jobs and retraining programmes, jobs in heavy manufacturing are now being displaced by a leaner workforce in higher value-added knowledge-based economies (KBEs). This shift in the employment landscape requires that workers adapt by augmenting productivity or through worker empowerment via technical, digital and high-tech skills training and retraining. This is especially the case for PMETs (Professional, Managers, Executives, and Technicians) being displaced by low wage competitors or more efficient machines and software apps.

It may be possible or even imperative for humans to increase productivity by learning to work through coordination with machines (i.e., as intelligence amplification or IA, and physiological abilities and power) and in some cases, skills are cloned from humans and then replicated at the workplace so that the number of human individuals for any given function is reduced.

Like all other solutions, the use of AI and IA lead to its own future challenges, for while jobs in the past were lost to machines that replicated human muscular strength and movements dexterity, AI has enabled jobs to be cloned and even improved by machines. In other words, jobs that are cloned may never require human intervention again. This is even before the era of turning on self-awareness in AI machines. There are currently no solutions or prescriptions for dealing with job loss due to the advent of AI, only strategies to mitigate evolving changes in technological developments at the workplace. Self-aware AI technologies may or may not create a collective where humans serve the functions of consumption, and engage in activities that contribute to the well-being of the collective maintained by AI.

Humanity, however, cannot afford the luxury of letting machines, robots, and AI do all the work for humans, even if we can appropriately address the critical and complex income and wealth-sharing dilemma. The major concerns are as follows: Firstly, we must not lose the motivation to work hard, and secondly, humans must continue to improve our skills, new or old, so that we can better exercise initiative and deal proactively with the "unknown unknowns". As experienced on the robotic production lines in car manufacturing, letting robots do all the skilled work, will one day result in us not having the requisite skills to develop future robots and AI machines for challenges not encountered before, and where there is no guarantee that these so-called intelligent machines are able to self-learn to face up to these new challenges.

Chapter 3

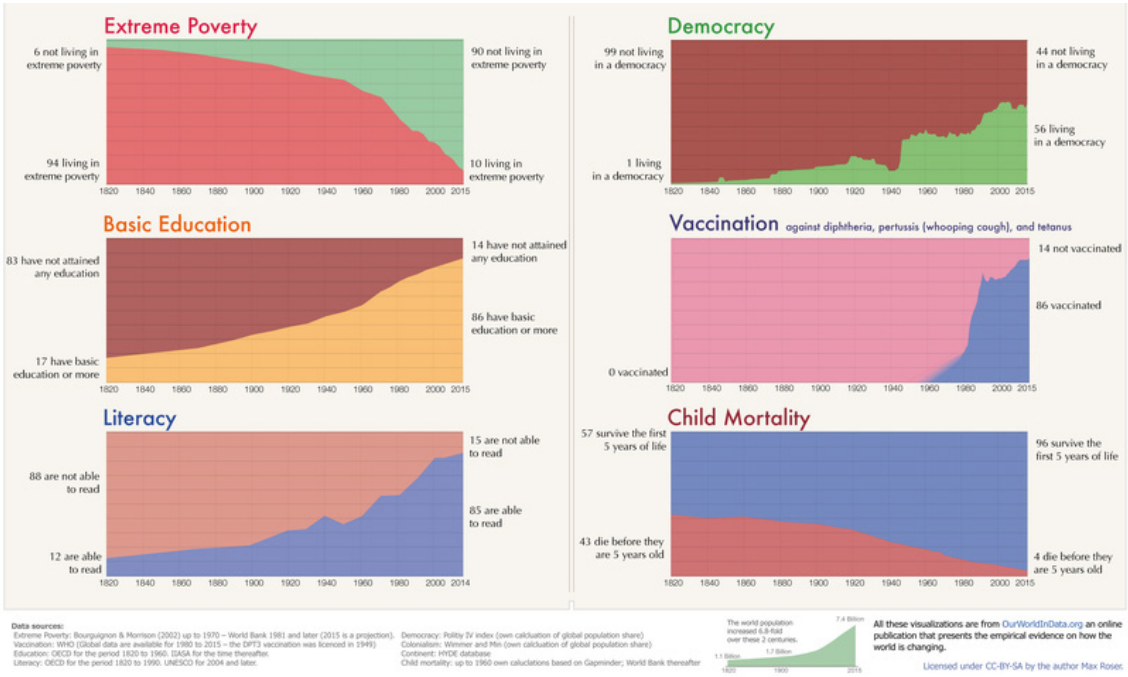
Technology Trends and Societal Impact

Luke PEH, Stephen LOW and Samir ATTALLAH

Technology in Our Lives

Inventions and technology are often taken for granted in our society. Modern inventors and innovators stand on the shoulders of giants and modern technology is possible today because of past discoveries. Technologies such as watches and clocks, electricity, telephones, flying, video cameras, credit cards, remote controls, the Internet, and domestic robots provide us with convenience and a better quality of life. As a consequence of technological development, the quality of life around the world has improved tremendously over the past century (see Figure 1), particularly in areas such as the mitigation and eradication of extreme poverty, and the provision of education, democracy and healthcare to ordinary people, especially in the developing world (Roser 2017).

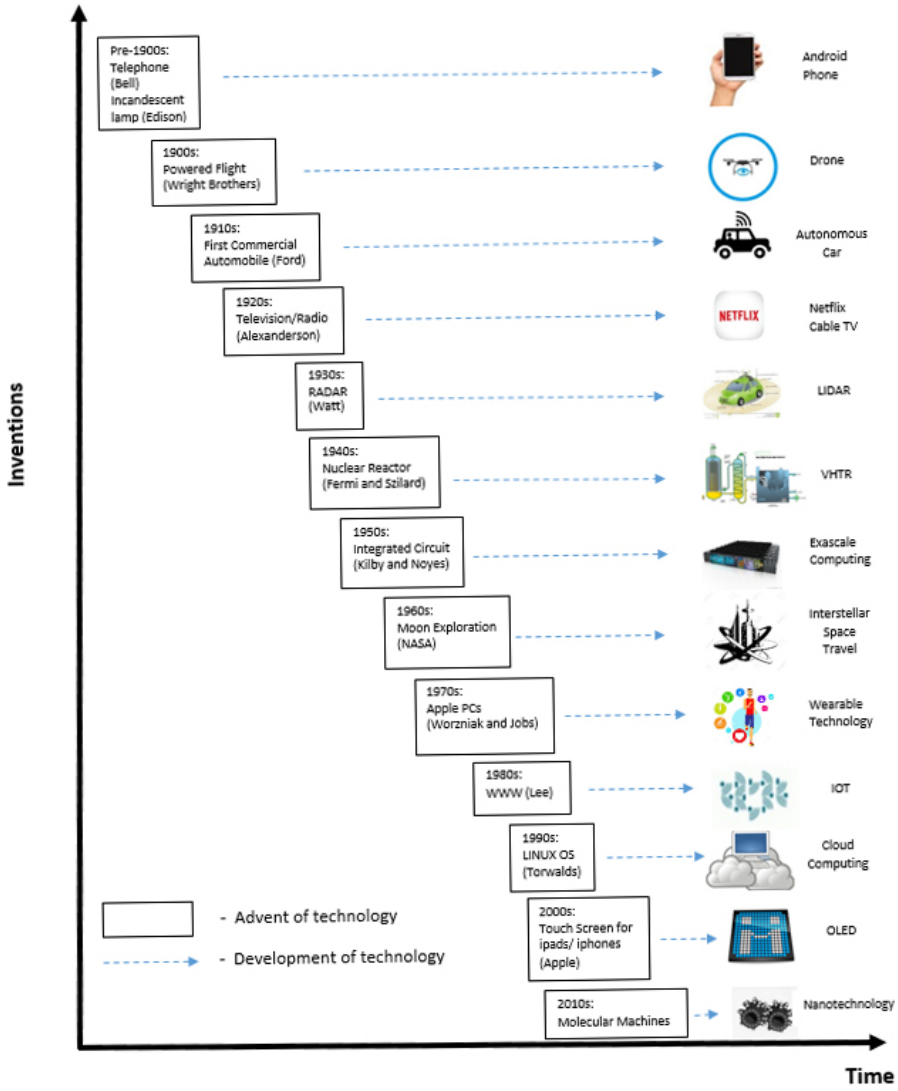
Figure 1. Our World in Data



Source: Oxford Martin School

Figure 2 provides an overview of the emergence of selected major technologies that have profoundly impacted our lives over the past century or so. Notable developments include the following: In the late nineteenth century, Alexander Graham Bell invented the telephone and Thomas Edison developed the incandescent lamp. In the 1900s, the Wright brothers built the first engine-powered airplane. In the 1910s, Henry Ford launched the Ford Model T automobile. The 1920s saw Ernst Alexanderson inventing both radio and television transmission systems. In the 1930s, Robert Watson Watt developed the radio detection and ranging (RADAR) system. In the 1940s, the first nuclear reactor was constructed. In the 1950s, Jack Kilby and Robert Noyce separately developed the integrated circuit. By the 1960s, astronauts were sent to space and walked on the moon. In the 1970s, Steve Wozniak and Steve Jobs unveiled the world's first personal computers. In the 1980s, Tim Bernes Lee invented the World Wide Web. In the 1990s, Linus Torwalds created Linux, a collaboratively written computer operating system. In the 2000s, Apple introduced touchscreen cellphones and tablet computers. Last year in 2016, three nano-technologists won the Nobel Prize in Chemistry for building miniature machines out of molecules (Ulaby 2015).

Figure 2. Notable inventions from the Late 19th Century to the Early 21st Century



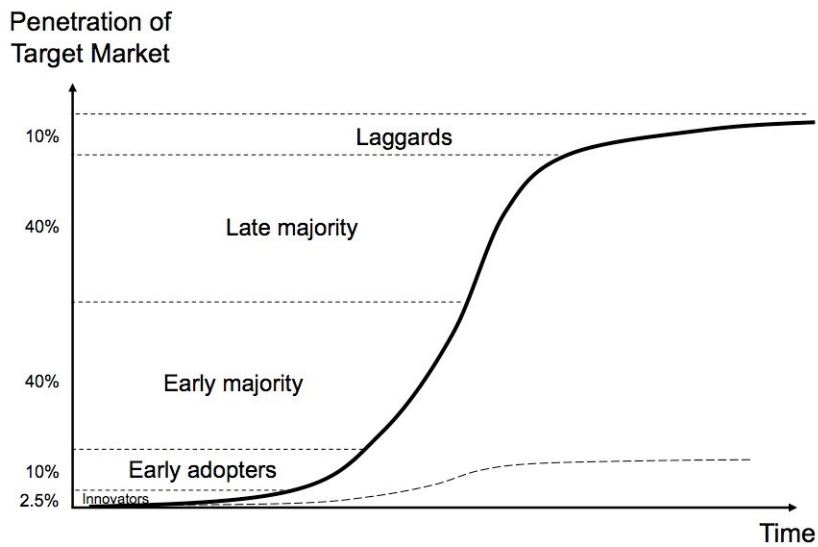
The trajectory of technological growth in the past century seems rather linear when compared to the more recent pace set after the diffusion of transistor and integrated circuit technology. Moore's Law, which suggests computer-processing speeds doubling every 18 months, is but one manifestation of this exponential change. There are those who predict that, sooner or later, the technological achievements of mankind will reach a point when quantum computing takes over from the current silicon chip, and growth escalates 'vertically'. This transition state is often referred to as the 'Technological Singularity' (Bostrom 2014). It is difficult to imagine what the world would be like 20 or 50 years from today, but it will certainly be, putting it mildly, quite different.

Technology Trends

According to science fiction novelist William Gibson, "The future is already here, it is just not very evenly distributed." Some new technologies, such as electric cars, drones for aerial photography and transportation, organic light-emitting diode (OLED) displays, have recently been introduced in consumer products after their research and development success. Others such as crypto-currency are already in use. In general, technologies go through three phases – prototyping, test-bedding and up-scaling. For example, Google kick-started its driverless-vehicle project in 2009. In Singapore, soon after in 2016, nuTonomy started test-bedding the reliability of the technology. There will be more autonomous vehicles on the roads in coming years. These are but harbingers of the future.

Digital natives, namely those born after 1980, who grew up with digital technologies and are often the innovators and early adopters of innovation, will be the first to embrace technologies such as cloud computing, augmented and virtual reality, 3D gaming, 3D printing, and digital-currency. No one would have imagined decades ago that technologies such as smart mobile phones would be so pervasive in our daily lives. Yet today, we are able to access the world-wide-web; make video and audio-phone calls everywhere; watch, record and transmit hi-resolution videos; download intelligent mobile apps such as way-finding and travel information; and control home-automation devices.

Figure 3. S-Curve of Technology Adoption

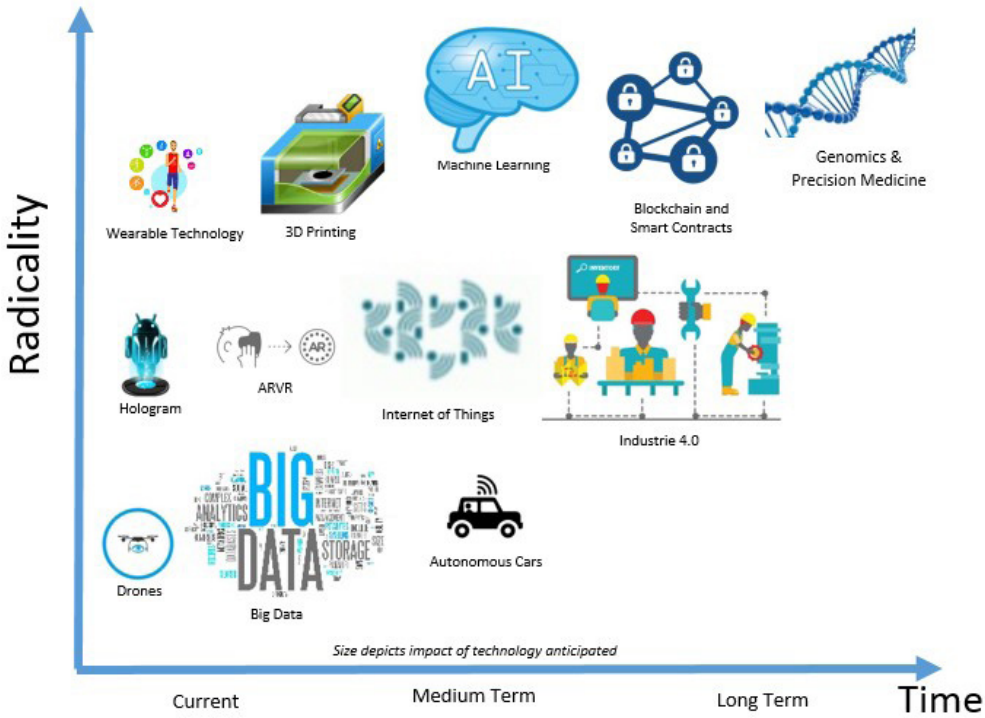


Source: Rogers 2003

Early adopters, or perhaps even the early majority, are already beginning to get interested in the Internet of Things (IOT) and its ecosystem, in applications such as Smart Home Technology (see Figure 3). The Amazon Echo in your household will be able to act as a central control point for your smart home gadgets, such as home security systems, (hue and intensity changing) smart bulbs, smoke detectors, home shades, and baby video monitors, and to integrate everything into a single, cohesive seamless user experience. The Google Home system is able to entertain requests and queries, ranging from playing a song from a play-list, weather forecasts, restaurant recommendations and movies, to reciting a poem.

The Alpha-Go computer system has demonstrated, to the amusement or chagrin of the world, that computers are capable of deep learning. In essence, it first learned the Go game by analysing moves by human players, and then generated all sorts of new moves to retrain itself. AlphaGo's victory marked a milestone for machine learning, heralding what is to come. It seems inevitable that these supercomputers will become smarter than our top scientists one day! The concept of Human-Level-Machine-Intelligence (HLMI) is predicted to be achievable by end of this century, in perhaps as early as 15 years' time.

Figure 4. Disruptive Technologies



There are many precursor examples of the technological avalanche we are going to see (see Figure 4). Here is a sample of those that could impact our daily lives in the near future:

Augmented Reality Virtual Reality (ARVR). Pokemon Go, an augmented reality game app, enjoyed phenomenal success and attention. ARVR could permeate all spheres of life, such as training using simulation, travelling, shopping, and entertainment. Virtual and augmented reality will enable users to experience a concert at home, have a vacation, and treat psychological problems such as drug addiction and phobia.

Big Data. Big or Smart data analytics will enable you to trawl data like never before, due to its volume, velocity, variety and veracity, for deeper insights and better decision-making. Big data becomes humanised or 'smart' when you are able to collate and analyse unstructured unruly data for better insights. Smart big data has been used to understand and target customers, optimise business processes, security and law enforcement, and at a country scale, improve infrastructural operations (Marr 2017).

Blockchain and Smart Contracts. Digital or crypto-currencies such as Bitcoin are leveraging blockchain technology to replace fiat currencies. Smart Contracts are protocols that facilitate, verify or enforce the negotiation or performance of a legal contract (Tapscott 2016). With them, one day, machines will be able to trade with machines in the Internet of Things (IOT) (Skinner 2016).

Drones. Drones will deliver online shopping purchases. They can also be used for other purposes, such as inspection of rails in underground tunnels, construction sites and also in contaminated areas, where human access is either difficult or dangerous.

Genomics. Genomics, and precision medicine, are going to create designer babies, as well as enable a patient to have an organ transplant suitable for his or her DNA. Precision medicine will be expected to cure patients without causing side effects.

Hologram. Hologram can be used for data storage, security, and electronic learning in the form of 3-D visualisation of objects' behaviour, projected onto 2-D computer screens.

Industry 4.0. Tesla and FoxConn factories leverage information and communication technologies to digitise their work processes. Thus, improved quality, lower costs, and increased efficiency are achieved when cars and smartphones become more assembled by robots (refer to Figure 5).

IOT. Using surveillance technology, computers have been integrated into exploratory, retrospective and prospective security, and law enforcement. The future will hold an

ecosystem in which all components that enable businesses, governments and consumers using devices such as remotes, dashboards, networks, gateways, analytics, data-storage, and security can communicate with one another.

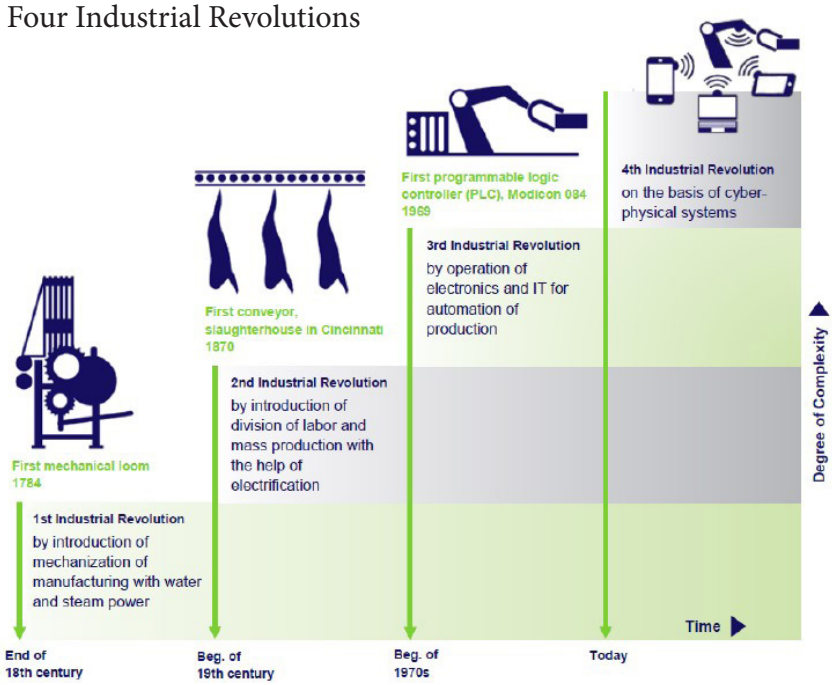
Machine Learning. In Google Search algorithm and autonomous vehicles, enabled by Google's proprietary tensor processing units, computers teach computers through appropriately designed learning algorithms.

Nanotechnology. Encompassing fields such as surface science, organic chemistry, molecular biology, semiconductor physics, microfabrication and molecular engineering, and nanotechnology is poised to create future products and applications in nanomedicine, nanoelectronics, bio-materials energy technology, as well as niche consumer products.

Wearable Technology. Small devices can be interweaved into our daily living, to be used for navigation, media communication, sports performance tracking, and assistive living such as health monitoring and hearing aids.

3D Printing. Additive manufacturing, derived from standard printing technology, can be applied to make on demand a wide array of customised objects such as medical casts and prosthetics, dentist's caps and crown, and bespoke commercial engine parts.

Figure 5. The Four Industrial Revolutions



Source: Kagermann *et al* 2013

These examples expose only the tip of the technological iceberg. "It's time to be afraid, very afraid." This alarming blurb, taken from the Sunday Times article on "The Rise of the Robots" by Martin Ford, Business Book of the Year in 2015, warns of a dystopian society in the near future where Artificial Intelligence (AI) or robots become sentient beings and overlords of the human race. However, AI-based Operating Systems and scaling up is already with us (Martin 2015).

There is going to be a tsunami of disruptive technologies, ranging from automation of knowledge work, mobile internet, internet of things, renewable energy, advanced materials, 3D printing, next-generation genomics, autonomous vehicles, cloud robotics, and cloud technology, to Blockchain. At times, the pace of development of technology appears to outstrip our ability to adapt. In teasing out these trends, we offer this oft-repeated advice – "Be the disruptor, or be disrupted." Technology is going to profoundly shape, reform and transform future professions and industries, and basically everyone's lives.

Pervasive Penetration of Technological Breakthroughs

Breakthroughs in technology are not limited only to exclusive innovation hubs such as the Silicon Valley. They are happening in every corner of the world. Developing countries such as Kenya have a cell-phone penetration of above 90%, which will slingshot the country and its key cities to catch up with the developed economies. More smart cities that are better managed through real-time monitoring of public utilities resources and consumption, transport, healthcare and education, will likely emerge in the future.

Innovation adoption and permeation can be accelerated. The Chinese, for example, have entirely embraced online payment services such as AliPay and TenPay in a very short span of time. In fact, China has been lauded as a beacon to the future, in terms of Superapps such as WeChat. WeChat is phenomenal – it is a copycat app that has evolved with abilities to chat, share photos, pay bills, transfer money, book appointments, or hail taxicabs. It is an amalgam of Facebook, Whatsapp, Snapchat, PayPal, and more.

There is pervasive penetration of technological breakthroughs even across social stratifications. M-Pesa, a mobile phone based service that is able to perform money transfers and micro-financing services, has helped people living in countries such as Kenya to remit money instantaneously at a much lower cost. With more and more incubators and accelerators, we anticipate that innovation adoption will be further hastened.

Will the United States benefit from re-shoring, as they turn towards automation in their factories due to rising offshore labour costs? Will Japan, among the first movers in the

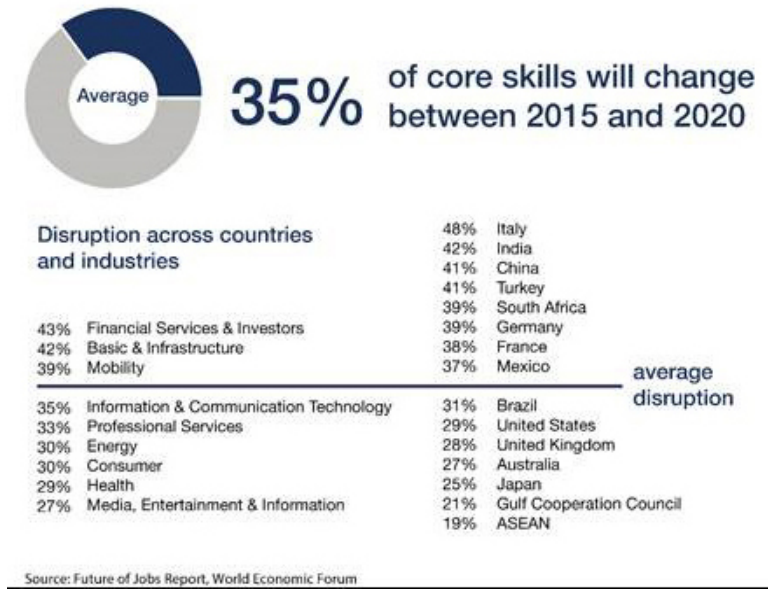
deployment of robotics and automation, be able to further exploit them to help eradicate the challenges of her (ageing population) silver tsunami? Will China encounter massive unemployment and social instability arising from more automation? Only time will tell.

Skills Disruption to Professions and Industries

In "The Industries of the Future", Alec Ross (2016) suggests how robotics, cyber-security, genomics, big data and digital technology are going to affect every industry and our daily lives. Robots are CAPEX items and can work tirelessly without going on strike. With robots, there is no need for employee welfare and benefits such as insurance, workman compensation, and they have minimal downtime. More robots will therefore be employed, and human workers need human-computer interface (HCI) reskilling as they need to work with these machines. The impact of technology will excite optimists with unprecedented opportunities. Pessimists will dread the possibilities that jobs and livelihoods will be changed and even lost.

Technology is advancing at break-neck speed. "Radical, disruptive innovations", a term coined by Professor Clayton Christensen, are upturning industries such as the media, transportation, and hospitality, where services such as Youtube, Uber and Airbnb undermine incumbents with speed, agility and superior offerings. The impact of technologies will be pervasive. Already, some professions are encountering disruptive onslaughts by technology (see Figure 6; World Economic Forum 2016).

Figure 6. Skills Disruptions Across Countries and Industries



In media/journalism, more people currently read online, and turn to Flipboard for personalised news. Could the work of copy-editors be supplanted by Grammarly, an English-language platform? IBM Watson competes with management consultants to be a 'C-Suite Advisor". Big Data analytics enable individuals and companies to trawl data and not rely on statistical sampling to obtain insights by themselves. In construction, building information modelling has long replaced paper drawings and plans. Physical prototypes have been replaced by simulations and building performance analysis, which can be done via computational fluid dynamics, urban heat mapping, wind flow, etc.

In education, face-to-face teaching was axiomatic. However, Massive Open Online Courses (MOOC) such as Coursera's "Introduction to Computer Science" course was enrolling up to 300,000 students in a single class. Udemy demonstrated that any expert could host and run a MOOC. Courses are no longer privy and exclusive that they must be taught by academics. Additionally, there are Small Private Online Courses (SPOCs), and of course, not forgetting, Wikipedia, a corpus of 35 million articles, available to the public at no cost. These new entrants require a paradigm shift and a change in the *modus operandi* of traditional education providers.

In accountancy and auditing, open source accountancy software packages, such as Kashflow and Quickbooks, are reducing corporate reliance on professionally trained accountants or accounting firms. These easy-to-use software apps enable users to navigate abstruse language and tax regulations. Similarly, in the legal profession, voluminous documentation and arcane language will no longer be barriers to operations. The deployment of technology using software tools such as back-office systems and legal search tools, as well as Big Data, will enable lawyers to find the best and most relevant cases to help them.

In healthcare, crowdsourcing platforms such as NHS Choices and WebMD network attract more unique visits each month by patients than do all the doctors in the US combined. Half of US doctors use Epocrates to find out how different drugs interact. Telemedicine enables patients to consult their doctors using a live video feed for real-time medical care or diagnosis. Neuroprosthetic devices enable paralysed tetraplegics to move their limbs (Susskind 2016).

Technological Conundrum and Societal Impact

Futurists such as Ray Kurtzweil and Elon Musk enthrall us with their vision of sustainable energy, cyborgs and interplanetary colonisation. However, we should not fall into the

pitfall of the aggrandisement of technology. There have been a few false dawns. Technology alone will not solve all our problems. In fact, technology may sometimes solve some problems but in the process, create more new ones. For example, technology such as extracting energy from fossil fuel causes global warming through pollution. The elephant in the room of technology advancement is the possibility of mass obsolescence of the human workforce. Could the proliferation of AI mark an economic Armageddon? Is Big Data and intrusive surveillance the prelude to an Orwellian society?

The ambivalence of technology is something world leaders, scientists, and all of us have to contend with. Unfortunately in this case, we may not have the benefit of acuity of hindsight. The modicum of truth is that the human race may be at an inflection point in history. Even Stephen Hawking has expressed concerns on the omniscience, omnipotence and omnipresence of AI – the concept of the technological singularity, or super-intelligence that will abruptly trigger runaway technological growth, and unfathomable change and its consequences to human civilization.

It is an understatement that technology has changed how we work, live, play and interact. We are in a technological and social maelstrom. To remain viable, businesses always have to find ways to create or maintain a competitive edge in the marketplace. This is further complicated by the need to leverage disruptive technologies, and to improve productivity and thus maximising profit through aggressive application of automation, robotics and IOT. This is particularly important as ever-shorter product lifecycles are pushing businesses to remain nimble all the time.

Parents and young adults are justifiably worried about the professions that become outdated by automation of skill and knowledge workers. Those already in the workforce are worried about how they can keep up with the pace of change. The aged are worried they will be broadsided by these technologies and become obsolete. It is a fallacy that automation is only going to threaten blue-collar workers of routine and repetitive jobs. Professionals such as accountants, doctors, lawyers, and professors rest on their laurels at their own peril. Individuals have to be resilient and prepare for these upheavals, through up-skilling or reskilling themselves with emerging skillsets to maintain their employability.

Governments are trying to leverage technology to improve the economic and social wellbeing of the population in general, whilst simultaneously minimising its environmental, social and political impact. In particular, governments have to figure out how to prepare their citizens for the prospective economy; schools and institutions of higher learning are trying to fathom how to prepare students for the unknown future.

Weighing the Benefits and Threats of Technology

Our finite resources cannot solve the "Billion Person Problems" of this world such as food and water, energy, environmental damage and climate change, education, and ageing. There are undeniable benefits from advancement in technology. Embracing technology is our only hope. Desalination, nano-filtration and reverse osmosis technologies have enabled purification of water, with excellent chances of eliminating global water shortages. Food security levels can be increased by genetically modified farming methods. Developments in sustainable and clean technology such as photovoltaic panels have brought electricity to villages and significantly improved lives where electrical supply infrastructures are absent. Electric cars reduce noise and air pollution. Online learning has brought the world to the classroom, as well as brought the classroom to the world. Assistive technology has increased independence and wellbeing of the disabled and aged. The sharing economy has encouraged sustainable consumption and production and fostered stronger communities in cities. The list goes on.

Large technological corporations such as Apple, Alphabet, Microsoft, and Samsung are encroaching into all spheres of industry, and acquiring promising Small-Medium Enterprises and start-ups, eliminating future and healthy competition. This could widen the gap between rich and poor, and exacerbate income inequality. Titans of technology, such as Google and Facebook, are collecting troves of data about everyone. The National Security Agency (NSA) and supra-national intelligence organisations such as the 5-eye project have been accused of spying on individuals. Personal computers and mobile devices have back doors that can be hacked into and exploited. Given this broad access, many countries and commercial companies can readily deploy these hacking tools for political and commercial espionage.

The other major concern is how hostile governments or terrorists can paralyse a city's critical infrastructure such as causing massive blackouts or signal interferences that could result in severe loss of life. It will not be too far-fetched to assume that nanobots and biotechnology could be misused by armed forces and terrorists alike. They can specifically target and assassinate humans. Rogue deployment of artificial intelligence could plummet humanity into the dark ages (Martin 2015). Finally, without a radical reassessment and restructuring of our economic and political structures, our economies may implode. We have to urgently and carefully assess the societal implications of technology advances, particularly human-displacing robots and AI. Every new development entails its own possibilities, but there are always risks of misuse and abuse of these technologies, as well as many unintended societal consequences.

Conclusion

The sobering conclusion is that we are certainly living in a volatile, uncertain, complex and ambiguous (VUCA) environment because of the radical and disruptive technological changes that are taking place around us, every day and everywhere. The societal impacts of technology advances affect everyone, and at every level.

Singapore's Smart Nation Initiative, which covers domains in transportation, home and environment, business productivity, health and enabled ageing, and public sector services to support better living, stronger communities and create more opportunities for all, is heavily anchored to technology. This is an All-of-Singapore project that requires inclusive citizenry participation, as well as a concerted effort by its government.

Disruptive developments require a radical rethink of entire industry structures and value chains. Enterprises have to understand the new plane of competition and threats from disruptive innovation and reconsider their 'business case'. Instead of considering it a zero-sum game between automation and manpower, or robots as substitutes for human workforce, we can reframe automation not as a threat but as an augmentation opportunity to level up, to leverage on technology to add value to our endeavours (Davenport 2015). Companies have to invest in reskilling their employees, support labour mobility and job rotation, collaborate with other companies across industries, etc.

Will automation create or kill jobs? As makers and users of technologies, everyone ought to continue to derive lessons from history. Without a thorough understanding of historical perspectives, on how the industrial and technological revolutions since the late eighteenth century have shaped human society, it will be challenging for us to make sense of and adapt to the changes in the future. Individuals have to be cognizant of these trends and developments, and cultivate the resilience, attitude and drive to make bold changes in the way they think and act. As the saying goes, "Learn as if you were to live forever". Learning should be a lifelong pursuit. With a positive attitude, individuals will be future-ready to excel in their lives and career choices.

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Chapter 4

The Wealth of Singaporeans in Global Perspective: Risks and Challenges

Walter THESEIRA

Introduction

The average household in Singapore holds the bulk of their wealth in owner-occupied HDB flats, making Singaporeans uniquely vulnerable to risks that affect the value of HDB housing. Over 80% of Singaporeans live in HDB flats, with the vast majority owning their homes on a 99-year leasehold basis. The HDB flat is the single largest investment most Singaporeans will ever make, with median housing prices ranging around $405,000 in recent years (Phang 2015). The value of HDB flats is sizable enough relative to other assets that many Singaporeans may need to monetise their HDB flats to maintain their standard of living in retirement, since their CPF accounts alone may only meet basic retirement needs (Asher 1999; McCarthy, Mitchell & Piggott 2002).

The political and economic risks to HDB housing are significant in view of the substantial sum invested by Singaporean households in HDB flats. In particular, policymakers must grapple with the inherent tension between current HDB owners, who want the value of flats to be as high as possible, and prospective owners, who face increasingly unaffordable high-priced flats (Chua 2014).

Globalisation, in the form of international capital and labour flows, has also impacted the asset value of HDB flats. Although foreigners are restricted from purchasing HDB

flats, asset values of private and public housing in Singapore are linked (Ong & Sing 2002; Bardhan *et al* 2003), and foreign purchases of private housing in Singapore have grown in recent years (Liao *et al* 2015). However, the flow of migrants may also help stem Singapore's very low birth rates, which could erode the value of HDB flats in time.

Although the Government can mitigate the impact of globalisation and business cycles on HDB prices, Singaporeans must also take responsibility by making prudent housing purchase decisions. Unfortunately, evidence from behavioural economics suggests that housing investment decisions are often motivated by psychological and behavioural biases rather than by economic fundamentals. In particular, the continued appreciation of older leasehold HDB flats may, if left unchecked, result in prices exceeding fundamentals, increasing financial pressure on homeowners as leases near expiry.

Asset Value of Singaporean Households: Cross-National Comparison

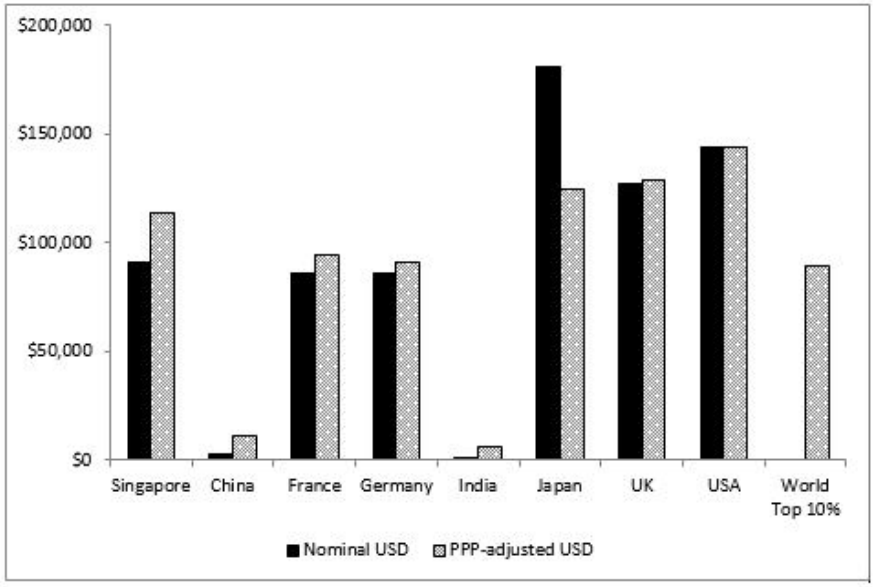
Cross-country comparisons of wealth and inequality are fraught not least because internationally comparable data on the distribution of wealth is unavailable in a consistent format over longer time periods. While researchers have assembled long-run data on income and wealth inequality for Europe and the United States (Piketty & Saez 2014), comparable long-run data on wealth inequality is not available for Singapore. Nonetheless, we attempt to put contemporary Singapore household wealth in perspective against a cross-section of advanced and developing economies.

The most recent comprehensive international study that includes Singapore, based on year 2000 data, ranks Singapore among the top countries worldwide in per-capita wealth (Davies *et al* 2011). Figure 1 shows that, in purchasing-power-parity terms, Singaporean per-capita wealth was US$113,631, exceeding the average per-capita wealth in every region of the world except for North America and Japan, and exceeding many European countries, including France and Germany.

Singapore's per-capita wealth actually exceeds the average wealth of US$89,569 held by the global top 10%.[1] With the global top 10% holding an estimated 70% share of worldwide wealth, the average Singaporean is in an enviable position globally.

1 By convention, international financial comparisons are usually converted to a common currency such as U.S. Dollars or Euros. Because market exchange rates do not completely reflect differences in the real purchasing power of currencies between countries, purchasing power parity (PPP) exchange rates are often used instead. PPP exchange rates usually increase the exchange value (and hence, estimated wealth and income) of developing country currencies, because of the relatively low price level of local goods and services in developing countries.

Figure 1: Cross-National Per-Capita Household Wealth in 2000



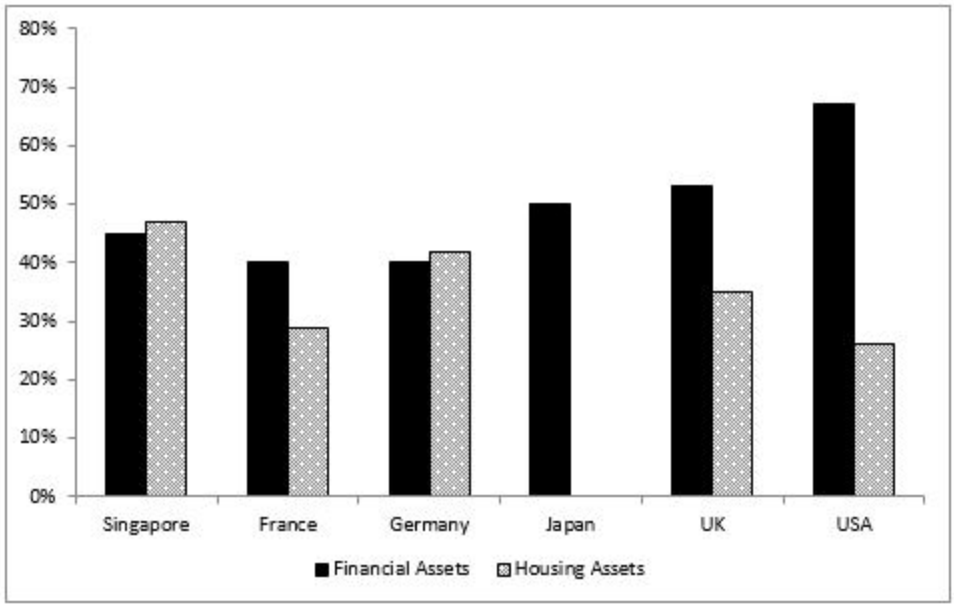
Source: Davies *et al* 2009

Figure 2 shows that housing comprises nearly half of Singapore household wealth. Singapore's housing share of wealth is high compared to many advanced economies, and reflects Singapore's high rate of home ownership, combined with the strong asset value of HDB flats and private real estate. While distributional data on household wealth in Singapore is not available, housing likely comprises far more than half of household wealth for middle and lower income households, given that financial asset ownership tends to be concentrated among the rich (Wolff 1998). Indeed, Figure 2, which is based on national household balance sheets, may understate the importance of housing as an asset to the average family. Consumer finance surveys show that housing is always the largest single asset class for all income groups (ECB 2016).

Although many Singaporeans believe that home ownership helps build wealth both for the individual and the nation, there is no clear positive relationship between home ownership rates, income, and wealth globally. While Singapore's 90% (public and private) home ownership rate is substantially above the global average of 68%, there are high and low income countries on either side of the home ownership spectrum. For example, the high-income Germanic and Scandinavian countries have extraordinarily low home ownership rates (Switzerland 31%; Sweden 39%), while the few countries with higher home ownership rates than Singapore's have modest incomes (Cambodia 95%; Lithuania 93%; Armenia 90%) (Fisher & Jaffe 2003). Within Europe, home ownership is positively

correlated with household wealth both within and across countries (ECB 2016), but given that significant financial resources are typically needed to purchase a home, it is not clear that buying a home, rather than renting, causes higher household wealth.

Figure 2: Cross-National Share of Household Wealth by Asset Type in 2000



Source: Davies *et al* 2009; Housing share for Japan not available

Of course, asset wealth and income, by themselves, do not make households better off: consumption is the goal of accumulating wealth. By some estimates, one in six Singapore households are millionaires (Mahtani 2012). However, translating that wealth into consumption is not straightforward, especially if the wealth is locked up in longer term investments and property. Internationally, housing wealth appreciation has been linked to higher consumption: when home prices rise, people spend more (Case *et al* 2005). But Singapore's rapidly rising housing wealth has not translated into higher current consumption, perhaps because Singapore households face liquidity constraints, or because they are more reluctant than households in other countries to borrow against the enhanced value of their assets (Phang 2004).

Exposure of Singapore Housing to Global Capital

As a small open economy, Singapore's asset markets have long been exposed to global capital flows. Singapore has historically benefited from foreign capital and investment,

particularly during Singapore's early years when domestic capital was relatively scarce. While the impact of globalisation on financial asset values is significant, we concentrate here on the impact on housing assets due to their relative importance to the typical Singaporean household.

Housing in key global cities such as Singapore is particularly affected by the flow of international capital and migrants. Estimates suggest that up to 35% of real estate transactions in the Asia Pacific were to foreigners, and in Singapore, approximately 11% of private home sales in the late 2000s were to non-residents (Liao *et al* 2015). While Chinese buyers are frequently cited as drivers of housing demand across the Pacific Rim, from cities in Australia (Needham 2017) to Vancouver (Moos & Skaburskis 2013), the impact of migration on housing prices surpasses any one source country (Saiz 2007).

Singapore has attempted to manage housing policy by taking advantage of globalisation while mitigating the risks; relaxing rules on foreign investment during real estate market slowdowns, while tightening restrictions on the market when signs of overheating appear (Liao *et al* 2015). It is impractical to cut off the Singapore real estate market from global capital flows, especially since – as discussed shortly – the value of Singaporean housing assets depends on a sustained flow of migrants (necessitated by very low fertility and a rapidly ageing population). There is a growing risk, however, that global capital flows can unhinge residential property prices in Singapore and elsewhere from longer-term fundamentals, increasing systemic risk, and reducing affordability.

Effect of Behavioural and Financial Biases on Housing Decisions

Housing decisions are driven by psychological, social, and cultural factors, in addition to baseline economic fundamentals (Shiller 2007). In contemporary China, housing purchases are partially motivated by social norms where securing a marital home before marriage improves matrimonial prospects for a son (Shepard 2016). More generally, studies of housing market booms point to an outbreak of speculative psychology amongst homeowners and investors, stemming from both the fear that housing prices will spiral out of reach, and the desire to make quick profits from rapidly appreciating assets (Shiller 2007).

Singaporean investments in housing are also affected by social conventions, speculative manias and fundamental behavioural biases. The run-up in housing prices prior to the 1997 Asian Financial Crisis was so disconnected from economic fundamentals that it took two decades for housing prices to recover to pre-crisis levels. Today, buyers of older HDB flats may likewise be holding an inflated view of the future asset value of their flats.

HDB flats are sold on a 99-year leasehold basis. There is currently no policy providing for the systematic renewal of HDB flat leases, although a small number of older flats have been demolished under the Selective En–Bloc Redevelopment Scheme, which provides affected residents with a replacement new flat on a new 99-year lease. Without redevelopment, the value of HDB flats should logically decline toward zero as the lease expires, at which point the owner has no legal entitlement to occupy the flat.

However, the value of older HDB flats, whose leases will expire in half a century or less, has continued appreciating in recent years. For example, in 2016 a five-room flat with 56 years remaining on the lease sold for $950,000 – a price almost double that of some comparable new build-to-order flats (Ng 2017). Many buyers of such flats are young families, who will likely either outlive the remaining lease, or who will seek to sell their flats at retirement, at which point the remaining lease could be worth relatively little. On 24 March 2017, Minister for National Development Lawrence Wong reminded buyers that "for the vast majority of HDB flats, the leases will eventually run out… As the leases run down, especially towards the tail-end, the flat prices will come down correspondingly." (Wong 2017).

The Minister's comment sparked widespread concern that HDB flats might not, in fact, be the dependable asset middle-class Singaporeans have always assumed them to be, and contrasted with the Government's historic narrative that home ownership facilitates both nation-building and asset enhancement for the middle class (Vasoo & Lee 2001). Three weeks later, the Minister attempted to reassure HDB owners that "[an HDB flat provides] a good store of asset value, so long as you plan ahead, and make prudent housing decisions."

Unfortunately, the evidence from behavioural economics suggests that it is very difficult for ordinary homeowners to make 'prudent' housing decisions. At a fundamental level, the decision to prudently buy, sell, or finance property worth hundreds of thousands of dollars requires a certain level of financial knowledge and sophistication that home owners must expend considerable effort in acquiring. In the absence of such knowledge, it seems unlikely that the average home owner will make an informed decision. In addition, several powerful behavioural biases stand in the way of prudent decision-making on housing.

The endowment effect suggests that the act of ownership itself causes home owners to systematically over-value their properties relative to the market (Kahneman *et al* 1990). When combined with the typical loss aversion that investors exhibit (Kahneman & Tversky 1979), this means that home owners will be reluctant to sell their property at a fair price, and will tend to have unrealistic expectations when facing nominal losses (Genesove & Mayer 2001), as when the market value of property falls below the original purchase price. Taken together, this means that home owners are unlikely to react efficiently in the face of

market downturns, will wait too long to sell their homes, and are also unlikely to monetise their homes, even when it is necessary to finance retirement.

The asset market bubbles and busts of the housing market may also have origins in behavioural biases. Even in carefully controlled laboratory experiments, participants routinely overpay for assets which cannot possibly provide sufficient returns to justify the price paid, creating asset market bubbles followed by busts (Smith *et al* 1988). Even experienced participants are prone to overpaying for assets, suggesting that investors are inherently over-optimistic when valuing and purchasing assets – believing that someone else will always be willing to likewise over-pay for an asset whose fundamentals simply cannot support the inflated valuations. Eventually, of course, market fundamentals catch up, and boom turns to bust.

Effect of Demographic Ageing on Housing Assets

Most advanced countries will experience shrinking and ageing populations in the coming decades. In Singapore, population growth would be negligible without migration, as the Republic only recorded 33,725 citizen births in 2015, and 18,630 resident deaths in 2015. On a citizen population base of 3,375,000, this suggests that the 'natural' rate of increase was less than half a percentage point that year.[2]

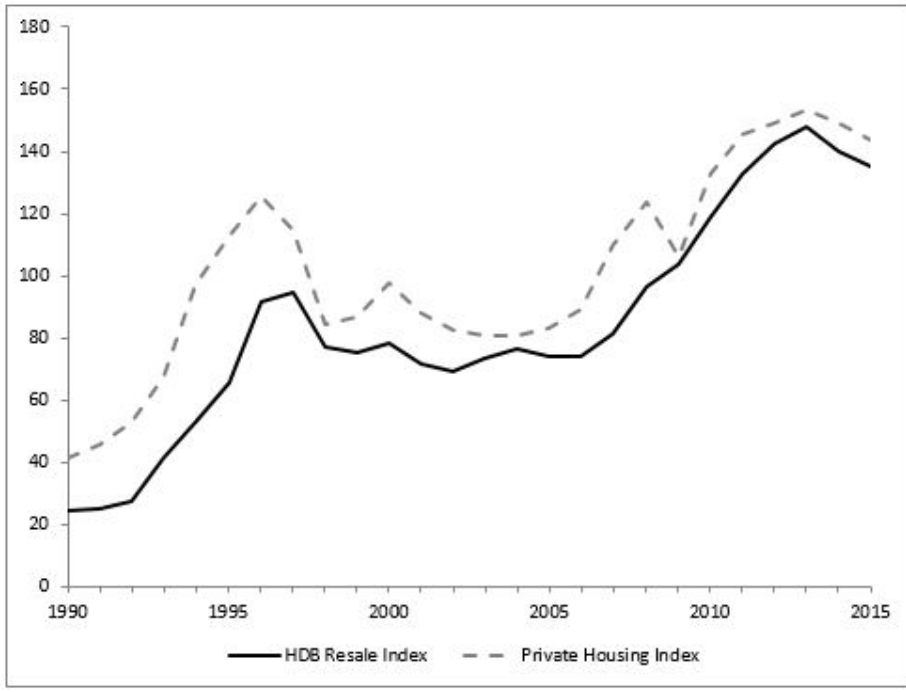
Population demographics naturally affect housing demand and prices, since housing is a long-lived asset and is typically built to outlast several generations of homeowners. When the population plateaus or declines, housing prices will naturally decline in tandem if nothing is done to reduce the supply of housing (by either demolishing or converting property) or to stimulate housing demand.

A study on housing prices in a cross-section of advanced economies predicts that demographic ageing will reduce housing price growth by around 80 basis points per annum on average, and by as many as 300 basis points per annum in the most rapidly ageing countries (Takats 2012). By itself, this does not mean that housing prices in Singapore will collapse as the population ages. However, it does mean that other sources of growth in the value of housing, such as improved labour productivity or increased migrant flows to Singapore, must offset the decline. To put the effect of demographic decline on housing prices in perspective, we conducted a simple simulation exercise.

2 Citizen birth statistics: Population in Brief 2016, National Population and Talent Division, Prime Minister's Office, Government of Singapore. Resident death statistics based on total registered deaths of 19,862, discounted by 6.2% non-resident deaths. Death statistics by citizenship status not available. Report on Registration of Births and Deaths 2016, Registry of Births and Deaths, Immigration and Checkpoints Authority, Government of Singapore.

Figure 3 shows the Singapore private residential property and HDB resale price indices from 1990 to 2015. Although the nominal annualised rate of growth over the last 25 years averaged 5.11% for private property and 7.04% for HDB resale property, returns have been volatile. The effective return on housing investment depends crucially on when property is purchased and sold – as with any other financial asset.

Figure 3: Singapore Housing Price Index, 1990-2015

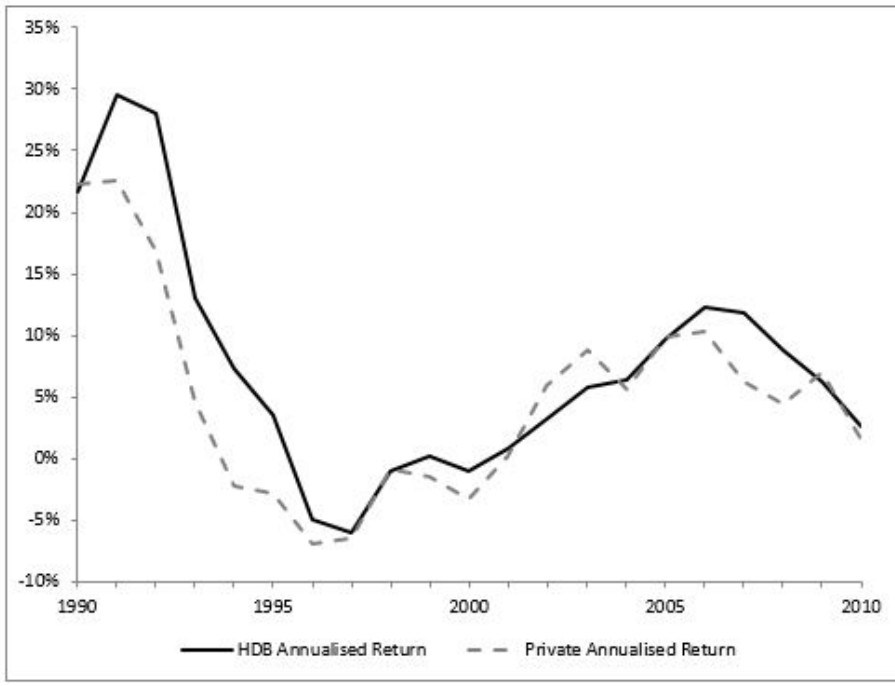


Source: Department of Statistics

Figure 4 reports the annualised return over a 5-year holding period. Each data point computes the annualised return on the basis that the home owner purchases a typical housing unit that year, and sells it precisely 5 years later. We ignore transactions costs and assume all properties appreciate (or depreciate) exactly according to the index value. The 5-year annualised return analysis ends in 2010; it reflects the returns for a home purchased in that year, and sold in 2015.[3] The 5-year holding period is chosen based on the HDB *Minimum Occupation Period* of 5 years, the minimum duration that an HDB flat buyer must hold a newly purchased flat before it can be resold.

3 While the private resident property price index is available starting in 1975, the HDB resale price index is only available from 1990 onwards.

Figure 4: Singapore Housing Annualised 5-Year Holding Period Return, 1990-2000



Source: Department of Statistics and Author's Calculations

The 5-year annualised returns to HDB resale property varied from a high of 27.28% per annum for properties purchased prior to the run-up in property values before the Asian Financial Crisis, to a low of -5.44% per annum, for properties purchased immediately prior to the Asian Financial Crisis. Strikingly, for any 5-year holding period between 1990 and 2015, there was a 1 in 5 chance that the home owner would have experienced a nominal loss in property value, and a 1 in 3 chance that returns on the property would fail to exceed the minimum HDB loan interest rate.[4]

To understand the effects of demographic ageing on HDB annualised returns, we consider the most extreme effects of demographic ageing, which are predicted to reduce housing price growth by up to 300 basis points per annum – or 3% per year – in South Korea and Japan in the coming decades. If Japan/Korea-style demographic headwinds impacted housing prices similarly in Singapore, HDB resale returns would fail to exceed the minimum HDB loan interest rate over nearly half of the 5-year annualised periods. 1 in 3 of the 5-year periods would see the homeowner experiencing a nominal loss in housing value.

4 The HDB loan interest rate is set at the CPF Ordinary Account rate plus 0.1%. The CPF Ordinary Account interest rate itself is set based on the higher of 2.5%, or the average short-term interest rate set by Singapore banks. In general, the HDB loan interest rate is lower than bank issued mortgage rates.

Demographic risks could significantly impair the returns to housing assets in Singapore in the near future, precisely at a time when the value of those assets will be needed for consumption in retirement.

Conclusion

While the average Singaporean household possesses wealth in excess of the global top 10%, a substantial portion of this wealth consists of owner-occupied HDB flats, making Singaporeans uniquely vulnerable to risks that affect the value of HDB housing.

Globalisation, in the form of international capital and migrant flows, has affected Singapore real estate values, as in other global cities, sparking calls to limit the impact of foreign speculation in the Singapore housing market. But migrants are needed in Singapore to counterbalance future demographic risks. The natural rate of population growth, excluding immigration, stands today at practically zero; it is clear that substantial immigration of working-age households – or substantial increases in fertility rates – will be required to counteract demographic headwinds which could otherwise eliminate housing price appreciation, or even cause sustained depreciation in housing values.

Another risk arises from investor psychology and poor financial literacy. Singaporean homeowners may fail to appreciate the fundamental reality that HDB housing is a limited-duration leasehold asset and will rapidly decline in value towards the end of the lease term. While some may be making these investment decisions strategically, betting that the Government will offer generous terms for lease renewal or redevelopment, others may be succumbing to behavioural biases by paying too much for HDB flats in the mistaken belief that someone else will always be willing to pay more in defiance of market fundamentals. Other behavioural biases make it less likely that Singaporeans will react efficiently to market downturns, and will be reluctant to monetise their housing assets to help provide for their retirement.

Overall, the evidence suggests that Singaporeans should take greater responsibility for, and critically evaluate, their housing investment decisions. While earlier generations of Singaporeans have benefitted tremendously from appreciation in HDB asset values over past decades, these gains are unlikely to be repeated in the future, as Singapore rapidly ages and migrant flows slow. The Government may need to increase public education on the economic fundamental value of leasehold property, failing which, a systematic and fair solution to end-of-lease tenures will be required. The treatment of leasehold property in the United Kingdom, where lease extensions are routinely made available at market rates to leaseholders, could provide some direction.

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Chapter 5

Disruptions and Discoveries in World Economic History

Mark DONOGHUE

Introduction

The British vote on 23 June 2016 to leave the European Union (a decision known as Brexit) reverberated globally as its implications were digested. Will Britain's departure strengthen or weaken the European project as EU members shape a post-Brexit Europe to their national advantage? While, at this stage, the global impact of Brexit on trade, investment and immigration flows remains unclear, Britain's secession is likely to produce economic and political disruptions, even if Britain succeeds in retaining full access to Europe's single market. Brexit involves disentangling Britain from a complex set of European interconnections and affiliations affecting every dimension of economic life, a reminder of how interconnected our world has become, where decisions taken in one place can have pervasive global repercussions.

Britain may no longer account for a large share of global trade or commerce (about 4.0% today against 30% at its peak in 1850), but it looms large in Europe where it's long been a force for deregulation and economic dynamism in a region largely bereft of either. In unsettled times, households and firms look to tighten their economic belts. Any disruption to European growth will certainly have a meaningful impact, particularly if the Brexit decision encourages other nations in Europe to follow suit. If Brexit proves disruptive, it should be remembered that it did not suddenly appear from nowhere. It was borne of a

growing frustration with the appropriation of economic power by a small group of global elites, a reaction to the pessimism experienced by many around the world who feel they've been left behind. In this, Brexit is but a symptom of much broader changes now underway.

Yet major disruptions like Brexit are nothing new. If Brexit marks a significant break in continuity in the global economic order, the Brexit process also opens up new possibilities and opportunities for Britain, perhaps not with Europe, but with the rest of the world. There is no single path to economic or political reform for all times and places. Life is dangerous, unpredictable and full of strife. But hard times build resilience. Transforming adversity into something positive is a natural part of the human condition. So, if handled properly, Brexit could have a positive influence by stimulating and inspiring new opportunities.

World Economic History

World historians concentrate on wider historical themes and perspectives, and how they have come to shape our daily lives. A global approach to economic interconnections, interactions and interdependencies helps deepen our understanding of how our own national and regional histories are shaped. Focusing on local, national or regional history is considered narrow and parochial. Showing how local or national trends and events are felt on a global scale has the virtue of highlighting the interdependencies and interconnectedness of varied social, political and economic systems (Bayly 2004).

The world is a composite of cultures and peoples reacting and responding in varying ways to processes of change. These processes have origins in different parts of the world and spread from there. Many seem to have arisen simultaneously. Indeed, processes that started in one place, began to impact other cultures, often in ways adapted to the needs and cultures of those people, so altering how people across the globe dressed, ate, thought, prayed, governed themselves as well as how they made money. Such broader perspectives reveal the texture of the past and enlarge the map of knowledge by encouraging new avenues or directions in historical inquiry.

Historians argue that the modern period from circa 1500 till the present played host to the growth of long-distance trade, migration and commerce. The critical factor binding all parts of the globe and giving rise to an unprecedented growth in cross-cultural encounters was the expansion of international commerce and maritime traffic. Developments in international exchanges and trade patterns, driven by European exploration across the globe, were tied together by imperial port cities like Shanghai, Aden, Rangoon, Zanzibar and Singapore, hubs of communication, migration, transport, and commodity flows where different peoples, traditions, and cultures met at the intersection of cities and seas.

Angus Maddison (2007) and Robert Gordon (2016) have observed that for almost fifteen hundred years, between the Roman Empire and the Middle Ages, the world economy barely registered any growth (see Table 1). Only in the modern period did that situation change in any significant way. In fact, even two hundred years ago almost everyone in the world was poor, barely scratching out a subsistence living. What economic discoveries or disruptions snapped the global economy out of its economic slumber? What economic factors turned human life inside out?

Table 1. Rate of Growth of World per capita GDP (annual average compound growth rates)

	1–1000	1000–1500	1500–1820	1820–70	1870–1913	1913–50	1950–73	1973–2003
Austria	0.00	0.10	0.17	0.85	1.45	0.18	4.94	2.14
Belgium	−0.01	0.14	0.13	1.44	1.05	0.70	3.54	1.87
Denmark	0.00	0.12	0.17	0.91	1.57	1.56	3.08	1.70
Finland	0.00	0.03	0.17	0.76	1.44	1.91	4.25	2.07
France	−0.01	0.11	0.14	1.01	1.45	1.12	4.04	1.72
Germany	0.00	0.10	0.14	1.08	1.61	0.17	5.02	1.58
Italy	−0.06	0.18	0.00	0.59	1.26	0.85	4.95	1.98
Netherlands	0.00	0.12	0.28	0.81	0.90	1.07	3.45	1.67
Norway	0.00	0.08	0.09	1.06	1.38	2.18	3.25	2.81
Sweden	0.00	0.11	0.17	0.66	1.46	2.12	3.06	1.57
Switzerland	0.00	0.09	0.17	1.32	1.66	2.06	3.08	0.67
UK	0.00	0.12	0.27	1.26	1.01	0.93	2.42	1.93
12 country average	−0.03	0.13	**0.14**	**1.04**	**1.33**	**0.84**	**3.92**	**1.77**
Portugal	−0.01	0.07	0.13	0.11	0.58	1.39	5.45	2.26
Spain	−0.01	0.08	0.13	0.36	1.25	0.17	5.60	2.70
Other	−0.03	0.03	0.13	0.74	1.37	0.87	4.89	2.78
Total western Europe	**−0.03**	**0.12**	**0.14**	**0.98**	**1.33**	**0.76**	**4.05**	**1.87**
Eastern Europe	**0.00**	**0.04**	**0.10**	**0.63**	**1.39**	**0.60**	**3.81**	**0.87**
Former USSR	**0.00**	**0.04**	**0.10**	**0.63**	**1.06**	**1.76**	**3.35**	**−0.38**
USA	0.00	0.00	0.36	1.34	1.82	1.61	2.45	1.86
Other western offshoots	0.00	0.00	0.20	2.19	1.76	1.21	2.60	1.80
Total western offshoots	**0.00**	**0.00**	**0.34**	**1.41**	**1.81**	**1.56**	**2.45**	**1.85**
Mexico	0.00	0.01	0.18	−0.24	2.22	0.85	3.17	1.29
Other Latin America	0.00	0.00	0.15	0.05	1.77	1.54	2.47	0.70
Total Latin America	**0.00**	**0.01**	**0.16**	**−0.04**	**1.86**	**1.41**	**2.60**	**0.83**
Japan	**0.01**	**0.03**	**0.09**	**0.19**	**1.48**	**0.88**	**8.06**	**2.08**
China	0.00	0.06	0.00	−0.25	0.10	−0.56	2.76	5.99
India	0.00	0.04	−0.01	0.00	0.54	−0.22	1.40	3.14
Other east Asia	0.00	0.05	0.01	0.09	0.82	−0.24	2.89	3.23
West Asia	0.02	−0.01	0.01	0.40	0.79	1.45	4.47	0.65
Total Asia (excl. Japan)	**0.00**	**0.04**	**0.00**	**−0.10**	**0.43**	**−0.08**	**2.87**	**3.88**
Africa	**−0.01**	**−0.01**	**0.00**	**0.35**	**0.57**	**0.91**	**2.02**	**0.32**
World	**0.00**	**0.05**	**0.05**	**0.54**	**1.31**	**0.88**	**2.91**	**1.56**

Source: Maddison 2007: 383

Global connections and interactions certainly intensified from the late fourteenth and early fifteenth centuries driven by new pressures and opportunities. Major global maritime networks like the opium triangular trade were established, bringing different regions into closer concert. But what historical forces fostered the emergence of an integrated and interdependent economic world in modern times? What continuities and discontinuities can be discerned in modern world economic history?

Oceans of Trade

The "discoveries" of Christopher Columbus and Vasco da Gama in the final decade of the fifteenth century laid the foundations for closer economic ties between East and West that accelerated the process of globalisation. It's hard to exaggerate how increasingly connected the global economy became after those discoveries. The Columbian Exchange involving the bartering of new food items like maize, potatoes, and tomatoes from the New World for cattle, sugar, coffee, and wheat in the Old World kindled a surge in global trade that has echoed down the centuries. The arrival of the potato in Ireland sparked a population explosion in the eighteenth century, the Great Famine in the mid-nineteenth, and the mass exodus of the Irish to other countries thereafter. Ireland was forever changed.

Economic fortunes have long been tied to maritime trade, looking across the oceans, seeking out goods and products to turn into money. Christopher Columbus and Vasco da Gama were in search of a new sea passage to India to access its riches. Columbus, in 1492, never reached India but instead discovered the Americas, inaugurating the process of European contact with a vast continental landmass that would transform its history forever. A few years later, da Gama discovered a new sea route to India, via the Cape of Good Hope, widely regarded as marking a watershed in world economic history.

European discoveries and conquests in the Americas were not merely disruptive, but eruptive, a reckless violence bursting force as European and African diseases wiped out indigenous societies (Maddison 2007: 94). Surviving indigenous populations were reduced to servitude as chattel labour for plantations and mines or farming in subsistence agriculture. European colonial governance tightened over time as European states vied for new territories and resources. Spain focused its efforts in Mexico and Peru where major silver mines were located; the Portuguese concentrated on developing large plantations in Brazil; while, later, French and British settlers transformed land-use patterns across the Americas by exploiting African slaves on plantations, underpinning the Atlantic slave trade. The Atlantic Ocean became home to the world's greatest migration as millions of Africans were forcibly transported across this vast oceanic space.

Adam Smith, in 1776, believed Columbus' discovery of the Americas ushered in one of the greatest economic revolutions in history: the price revolution. The global economy received a powerful impetus from the discovery of rich silver deposits in the New World. The influx of silver to Europe reversed the long-run downward movement in prices as more silver chased the same quantity of goods. The resulting inflation was partially mitigated by outflows of silver bullion to pay for European imports of Chinese silk and ceramics, and Indian textiles and spices. Silver became the dominant instrument of exchange in the

international trading system. Kenneth Pomeranz (2000) has identified Europe's access to and conquest of what Adam Smith called "the wastelands of the Americas" as decisive in lifting international trade and exchange to new levels.

Over time, the European presence in the Atlantic and the Indian Oceans grew dramatically, expanding the range of interactions in every direction. When Captain James Cook first set foot in New Zealand in 1769 seeking fresh supplies, he encountered the Maori, a warrior people whose way of life, untouched for over five hundred years, was never to be the same again, as new settlers, especially from the British Isles, went in search of the old world in a new land. New trading networks gradually evolved into a complex, interconnected trading system centred on the two oceans, but bridged by the Pacific Basin (Belich 2009). This interconnected trading zone formed a global trading system that constituted the first form of globalisation.

Mercantilist Imperialism

Mercantilism, or trade protectionism, reigned supreme in the early modern world. The emergence of a class of merchant adventurers in search of profitable outlets for capital occurred in tandem with the rise of the modern state, which often sponsored, even sheltered, private mercantile endeavours overseas. Protection and collusion between private capitalists and political elites were the order of the day. Private companies were granted lucrative state monopolies to trade in spices and textiles across Asia and beyond. This public-private axis would transform the globe as merchant adventurers were empowered to explore other lands and conquer other peoples. European merchant capitalism laid the foundation for global European colonialism. Nowhere was this more evident than in India where Europeans began establishing trading bases after Vasco da Gama's discovery of a new maritime route to India. European trading bases were stepping stones for future territorial expansion, the crowning example of which was the private colonisation of India by the English East India Company – a first in world history. Never on this scale before had a commercial entity become an expansionist imperial power with its own standing army. The Company's territorial conquests marked a major shift in global power and the foundation of modern colonial empires.

The Indian Ocean had long been a major trading arena utilized by Arab, Persian, Chinese, Malay, Indian, and African merchants. This vast oceanic space was made up of several interconnected maritime trading systems, with commercial exchange and migration linking South Asia with Africa, the Middle East, South-east and East Asia, and indeed the Pacific Ocean for many centuries. It was relatively easy to cross due to the shifting pattern

of the monsoon winds (the winds that favour trade) and became an arena for competition among European empires with the Portuguese conquest of Malacca. The Indian Ocean became the major trading artery linking Asia to Europe following the decline of the overland Silk Road (Frankopan 2015). This trading arena was linked neither by a single language nor by political integration (although most of the Indian Ocean platform was part of the British Empire), but rather it was defined by mobility, circulation and movement.

In the second half of the nineteenth century, the Indian Ocean underwent a fundamental change in scale as the British Empire expanded eastwards to encompass territories around its rim. These encounters had a lasting impact on markets, communities, language, culture, legal systems, technologies, and social systems. The Indian Ocean lay at the heart of the British imperial economy, integrated by the force of capital in search of new outlets on the frontiers of South-east and East Asia. Migratory patterns underwent a fundamental reorganisation as the steamship uprooted people across the whole Indian Ocean arena – mobility and immobility, freedom and unfreedom were intertwined throughout this era (Harper & Amrith 2014).

Like the Atlantic sphere, the circuits of migration across the Indian Ocean, and the transformation of its ecology, responded to and fuelled change on a global scale. For example, Malayan rubber, originally imported from Brazil, tapped by Tamil migrant workers, fed the US automobile industry with 80% of its supply during the interwar period. Malayan rubber transformed the global economy and Malaya became the most economically valuable tropical economy in the British Empire. Malaysia's economy today remains tethered to the production of primary export commodities.

Until the early nineteenth century, the impact of European colonialism in Asia was modest. Asia's technological sophistication was greater than Europe's, and its major empires, the Ottoman Empire in the Near East, the Mughal Empire in India, and China and Japan in the Far East, enjoyed levels of wealth and economic development comparable to Europe (Christian 2015). China and India began the modern era as the world's two largest states. Both could have expanded overseas but chose not to. Resisting western incursions in the early modern period, Europeans posed no real threat to Chinese and Japanese sovereignty until the nineteenth century (Vries 2009: 154).

But infringements of Asian sovereignty grew as European military and naval power eclipsed once-powerful Asian empires. Western territorial encroachment expanded as Europe's technological, economic and military advantage gained a decisive edge. These economic developments in Western Europe were crucial in transforming the global pattern of production and exchange in all directions, in tandem with the evolving global

reach of empires on land and sea. Yet even after European empires began overtaking Asian empires, it was Europe that went to Asia and other places in search of riches.

Industrialisation

Industrialisation, first in agriculture and later in manufacturing, represented a major transition in world economic history. Heldring, Robinson and Vollmer (2015) argue that Henry the Eighth's break from Rome and dissolution of the (Catholic) monasteries in the mid-sixteenth century initiated changes in the rural social structure that fed a process of higher agricultural productivity "which would ultimately coalesce into the Industrial Revolution". The expropriation and redistribution of monastic land-holdings incentivized a new class of commercially minded farmers to innovate and be productive. New technology and techniques in agriculture, the extensive use of artificial fertiliser in particular, drove a system of intensive agriculture that elevated agricultural productivity. Agricultural revolution stimulated industrial revolution. But religious persecution ignited it.

The revolution in industry that occurred in the late eighteenth and early nineteenth centuries began in Britain, spread to Western Europe, then to North America, and eventually around the world. It was not a singular big bang event but rather evolved over time, as cutting edge processes, techniques and technologies crowded out others. Most agree on the profound impact of technological innovations, new inventions and scientific discoveries on global economic development. Mechanized machines like the spinning jenny replaced female hand-spinners, power-driven tools replaced hand-tools, and manufacturing production in textiles and metals shifted from artisan's homes to factories. Steam engines and railways, fuelled by a new form of energy – coal – further drove textile, steel and iron production. Britain's abundance of coal and colonies accelerated industrialisation. Later, cars replaced horses and electric light eclipsed whale oil. The wonders of modern life began spreading to the four corners of the world, although transformations varied from place to place, and often the new techniques had to be adapted to meet local circumstances (Lang 2006: 913-914).

The unique economic dynamism of the West in the modern period has several strands to it. Expansion of foreign trade went hand-in-hand with advances in maritime and navigational technology. "Without them, Western Europe would not have achieved its dominant role in world trade" (Maddison 2007: 81). This enabled European explorers and sailors to chart waters beyond the North Atlantic, the Mediterranean and the Baltic Sea.

Although the global transition led by Europe was uneven and contested, non-European states patterned developments in western capitalist institutions, such as the central bank, fiat money, capital markets, fiscal reforms, to keep pace with the Western engine. Japan, in Asia, went further than others in European modernisation, commencing in 1868 with the Meiji Restoration, a transition from feudalism to industrialisation. The scale and speed of invention and innovation throughout the nineteenth century and into the twentieth was unprecedented and truly transformative (Osterhammel 2014). Markets grew larger and deeper, urbanisation soared, specialised factory production was fostered, employment conditions became less onerous, and the era of consumer culture was born as per capita incomes rose sharply, first in Britain and Western Europe, then in the Anglosphere, and later in other parts of the world, giving this epoch its unique place in the global history of wealth (Maddison 2007: 69-70).

A Liberal Turn

In the early modern period, Europe enjoyed the advantages of intellectual diversity and political fragmentation that allowed new beliefs and often, even radical ideas to flourish and circulate all over the Continent as never before. Political and religious fragmentation ensured European states competed fiercely with each other. This created a pan-European market for fresh ideas among intellectuals that stimulated scientific innovation. Competition for ideas enabled inventors, scientists and entrepreneurs to flourish. Close geographical proximity facilitated the interchange of ideas and ideals among European intellectuals that ushered in the Age of Enlightenment.

In 1776, Adam Smith wrote of "the liberal plan of equality, liberty and justice". Today we call it the liberal idea. McCloskey (2016) and Mokyr (2017) persuasively argue that the great innovations in the modern era that drove the "great enrichment" of western society were the result of this simple, yet revolutionary, idea. "Give masses of ordinary people equality before the law and equality of social dignity, and leave them alone, and it turns out that they become extraordinarily creative and energetic" (McCloskey 2016).

The liberal idea operates in what is known today as "market economies" characterised by legal protection of private property rights and private contractual arrangements, the principle of free, fair and unfettered trade, the ability of rational individuals to acquire goods and services in market exchanges, and minimizing state interventions in economic life. The long-term causes of economic progress come from the musings of regular people who set upon developing profitable technologies, inventions and institutions. Ever since the late eighteenth century when Adam Smith inveighed against private corporations with special trading privileges, this liberalising approach to economic development, however imperfect, has been a linchpin of western economies.

But if the liberal idea could generate such remarkable prosperity in the West, surely its diffusion to other parts of the world would produce similar economic outcomes. Has this been the case? The fruits of a liberal economic (though not necessarily political) order have been spectacular. During the twentieth century, though especially after WW2, the old rich western countries have been joined by the likes of South Korea, Botswana, Ecuador and Taiwan in the great enrichment, all because they embraced market-oriented principles that afford greater economic opportunities in the form of more investment, a wider variety of goods and services, greater access to education and healthcare, better and higher paying jobs, increased provision of public goods, stable political environment and improved standards of living.

Not very long ago, China and India, together home to four-tenths of the world's population, were poor. But thanks to recent liberal economic reforms, these Asian economic giants are now the most dynamic forces in global trade and, as economic power continues gravitating toward Asia, are set to become (once more) the world's two largest economies later this century (see Table 2). The liberalising economic agenda embraced by China and India has brought as much opportunity as disruption. Hundreds of millions of Chinese and Indians have been lifted out of poverty within a few short decades. All possible because liberal economic principles have created more specialised and dynamic economies with new global connections and greater economic opportunities than either ever achieved under an "all-wise central plan".

Table 2. Levels of GDP, World and Major Regions, 1-2030 (million 1990 international $)

	1	1000	1500	1820	1950	1973	2006	2030
Western Europe	14.43	10.93	44.18	159.85	1,396	4,097	8,473	12,556
US	0.27	0.52	0.80	12.55	1,456	3,537	9,266	16,662
Other Western offshoots*	0.18	0.23	0.32	0.95	180	522	1,388	2,414
West	**14.88**	**11.67**	**45.30**	**173.35**	**3,032**	**8,155**	**19,127**	**31,632**
China	26.82	26.55	61.80	228.60	245	739	7,928	22,983
India	33.75	33.75	60.50	111.42	222	495	2,888	10,074
Japan	1.20	3.19	7.70	20.74	161	1,243	2,864	3,488
Other Asia	14.97	21.38	31.32	51.72	363	1,387	6,450	14,884
Latin America	2.24	4.56	7.29	14.92	416	1,389	3,644	6,074
Eastern Europe & former USSR	3.52	5.44	15.15	62.58	696	1,487	2,870	4,508
Africa	8.03	13.84	19.38	31.27	203	550	1,557	2,937
Rest	**90.53**	**108.71**	**203.14**	**521.25**	**2,305**	**7,868**	**28,202**	**64,948**
World	105.40	120.38	248.45	694.60	5,337	16,023	47,329	96,580

* Australia, Canada and New Zealand.

Source: Maddison 2007: 379

Conclusion

No historical event is without its connection or link to the past. The industrial revolution was not an isolated event. It began where the agricultural revolution left off, a period of technological improvement that rested on what had already been accomplished. Emerging long-distance economic, cultural and knowledge exchange is also part of an historical process. Larger historical transformation involves understanding how different patterns of encounters, affiliations, connections, and interactions across wide geographical boundaries evolve on a global scale over time. Thus the modern world was made.

Jill Lepore (2014) writes that: "Every age has a theory about the past and the present, of what was and what is, a notion of time: a theory of history." Competing theories have shifted history's dial. Before the modern age, theories of history were presented in supernatural terms. Leopold von Ranke, a founder of modern history, once wrote: "God alone knows world history". The divine ruled time, the hand of providence lay behind growth and decay. Providential theories of history tended to involve decline, not discovery, a fall from grace, the loss of God's favour. It's why Leonardo da Vinci, in 1519, had to conceal his engineering dreams whereas James Watt, in 1819, could crow about it from the rooftops.

Slowly history began to change. Change itself became fashionable. Historical explanations no longer appealed to the divine right. Theories of history became secular. Events in history were explained by preceding events in history rather than God's will. Later, in the eighteenth century, the ideologies of progress took hold; the nineteenth century had revolutionary and evolutionary theories; and the twentieth century had growth and then innovation. In our time, disruption is the bête noire of history. "It's a theory of history founded on … the question of whether a novelty is an improvement or a disruption" (Lepore 2014).

World history has witnessed countless economic disruptions and discoveries, most so little noticed they don't register having come and gone so quickly, leaving no lasting impression on the human experience. However, some disruptions and discoveries proved more durable, leaving not only a sharp historical mark behind but with the capacity to reorder the world. While difficult to anticipate they are neither new nor radical in world history. Coming to terms with these disruptive legacies, to learn from and react to them, has the capacity to contribute to our understanding not only of the economic workings of the past but also of the present, which can enable us to better prepare for the future. "So it ever was, so will it always be".

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Societal Needs

Chapter 6

What's so Social? Change, Integration, and Social Resilience

TAN Ngoh Tiong

Introduction

Modernisation, together with rapid migration and internationalisation, has made societies all over the world more pluralistic. Social change and transformation are especially acute in developing nations. Consequently, the world is quickly becoming more complex, with some governments and societies pushing back furiously against the migration trend and in other ways, as evidenced unexpectedly in United Kingdom's Brexit and Trump's U.S. presidential election victory.

How should society in general, and Singapore society in particular, deal with social change; and how should people from different cultures in close proximity relate with one another? How can we truly achieve social integration? What is the contribution of social work or government efforts towards building an inclusive society? And more importantly, can we build a resilient society that will help us move through the choppy seas ahead? This chapter seek to address some of these pertinent questions.

Every society has different people groups, each with their own interests. Sometimes, the differences in these agendas can be significantly pronounced, so much so as to polarise a society, presenting stumbling blocks to its stability and progress. However, we often have more in common with others than what divides us. In other words, our common destiny and humanity can help us bind together as one people (Tan & Tan 2013).

Politicians and governments desire solidarity, and seek to build a national identity to achieve this. Social anthropologists, on their part, look for unity in diversity (Clarke 1970). Social workers, on the other hand, strive to achieve greater bonding and social networks, to build a stronger and more compassionate society. Social work's key premise is that our civilisation is measured by how we treat one another, especially those in our society who are different and disadvantaged.

PM Lee Hsien Loong has pointed out the need for social integration, to reinforce the social glue that holds Singaporeans together as one united people (Tan & Tan 2013). Where differences may bring division, greater social inclusion – to mainstream those who might otherwise be side-lined, is essential. The philosophical value here is simply to respect differences, celebrate oneness, and to live and let live.

Human beings are by nature ethnocentric (Cooper 2012). All of us must address the subtle discrimination or stigmatisation of those who appear strange or different to us. Instead of prejudice, we need to consciously invest in getting to know other people and actively building relationships. We can find opportunities to join in and be part of the community. At a macro level, this means affording greater access for all to the benefit of every sector of society, whether it be education, health, housing, or the justice system.

The poor will always be with us, so it behoves us to seek out this group, to build up their potential, to provide training and skills development so that we are all, at different points, equipped to find jobs and security. We must recognise the dignity in humanity, no matter what our station of life. We must seek our neighbour's good, even if our neighbour may be different from us. This is what makes a caring and civil society.

In the area of age discrimination, for example, we can encourage and partner both people and organisations in productive ageing by seeking the contribution of senior citizens, not just for the sake of building income security, but more importantly, to grow the integrity that comes with it – helping them find dignity and meaning in life. A worthwhile life is one where each individual's unique capacity is recognised, and each one's ability can be demonstrated as significant, even in small ways.

Is building a gracious society only possible with a strong government? Can too strong a government hamper the development of civil society? Would society in general become weaker as a result of strong government? No doubt the government in Singapore has provided strong political and social leadership, but the challenge, in the face of rapid modernisation and internationalisation, is that every sector of society – the market, and the informal system – needs strengthening. In particular, civil society has to play its part in contributing to social development.

I feel that the government should not take responsibility or take over most areas of our life. Society, especially the civil sector, has to develop, and because of different interests and ideologies, there is the need for tolerance of some 'messiness'. There is a need to allow some degree of freedom for others to explore and develop in their own way. However, it is difficult to find a balance, so that one's freedom does not impinge on the wellbeing of others. It is not for us to impose our own ways on others.

Singapore needs to develop a stronger civil society, by building up the informal sector and strengthening community self-help. Community and grassroots groups are better positioned to respond to people's needs and concerns. The government's role perhaps is to stimulate and catalyse the growth of people groups, social enterprises, and NGOs, so that the people's concerns can be met where they are.

Can we not strive for a good balance between strong government and strong society? Government should together with the business and the informal sector form a united front to face the world, as this is important for our survival. We need to be able to compete effectively in the global arena as "team Singapore", not only in sports, but also in the business, cultural and social sectors as well.

Bridging the Divide and Social Work Intervention

Although differences can divide, we should not let this prevent us from the higher calling of building bridges and making connections. For example, we can and need to bridge the growing chasm of income disparity in Singapore. We can continue the government's good work of implementing measures to reduce the glaring contrasts between the rich and poor, so as to move towards greater social equity and social mobility. DPM Tharman (2015:1), in advocating that the government seeks to build a fair and inclusive society, said that social mobility "has to be part of our Singapore identity".

Instead of building walls and being exclusionary, we should work towards integrating the workforce, and engendering positive interaction and community life among different ethnic groups. Fostering neighbourliness, respect and goodwill between citizens as well as foreigners on our shores is vital. This makes Singapore unique and intriguing, and our nation like a masterfully woven piece of multi-coloured fabric.

Reducing the digital, or for that matter any, divide, will allow us all to leverage technology so as to impact positively our social life and wellbeing. For example, the increasing use

of technology to help the elderly and the poor, and to integrate marginalised groups, will not only build human capital but also bring about a better social climate and a more gracious society.

Social work's contribution, as a versatile profession, ranges from fostering social change and transformation to remedial actions such as counselling, support and welfare assistance to those truly in financial and social need (Morales & Sheafor 2000). Social work knowledge and practice provides an understanding of human society and social needs throughout the human lifespan. Social workers' training calls for a holistic and systemic perspective in understanding social problems.

Guided by this purpose and mission, social work seeks to enhance well-being and empowerment through building up capacities of individuals, families and communities (Lee & Hudson 2011). Social workers are active in steering systemic impacts on individuals to promote social well being. Amidst rapid change and many pressures of life, let us not go the way of the impersonal digitisation of people but seek to ensure that social systems, made up of people, should serve people (Rosenberg & Brody 1974). The goal is to bring about a more humane and responsive eco-system, a truly human community that supports capacity building.

The true value of social workers is not in their maintenance and promotion of the status quo, but as advocates and agents of change. Social workers empower individuals and systems, and pay special attention to those who may not have power or a voice, linking them to resources they need to sustain life. The goal of social change aims at an improved sense of wellbeing, better social functioning, and greater social cohesion and resilience. Building resilience is key to the enhanced social functioning of individuals and communities.

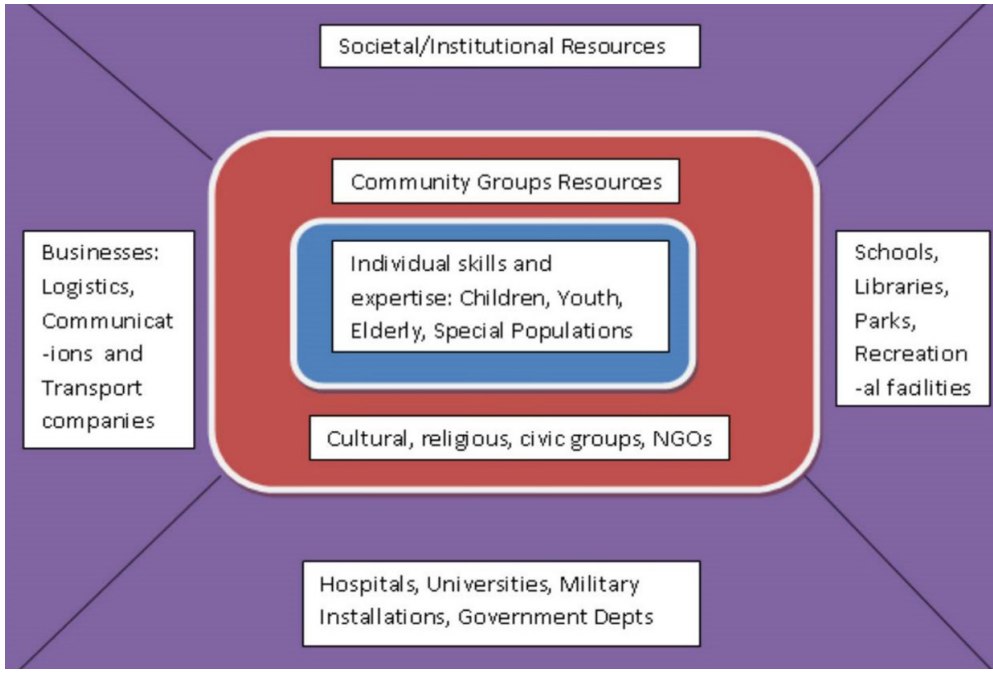
Community Development

Systems theory provides a framework for social capital development and an understanding of community resilience. Its emphasis is on identifying social and community assets, and citizen participation for collaborative actions. The aim of community resilience development is to understand and harness these resource systems – the support adaptive capacity – so as to be able to respond appropriately to and recover speedily from adverse situations besetting the community (Tornblom & Kazami 2012).

Asset-Based Community Development (ABCD; Kretzmann & McKnight 2005; see Figure 1) approach is a tool for community building. It is framed by assumptions about 'assets', 'needs', and 'community' and their associated community engagement (Kramer *et al* 2014).

The asset mapping approach is valuable to support partnership building, consensus creation, to link community agencies and the control of key community systems.

Figure 1. ABCD Asset Mapping



Source: Tan (2009), adapted from Kretzmann and McKnight (2005).

The ABCD Map shows individual, community, and societal resources in an inter-relational way. At the core of these community assets are the citizens: individuals with different strengths and expertise. Values and assumptions are also key to operationalising the ABCD Model for community asset development and distribution. Norris *et al* (2008) suggest that the eco-system framework is grounded in such values as collaboration, social justice and empowerment. The ABCD presupposes that social assets belong to the community and have to be shared equitably. This requires a collaborative approach to the sharing and use of community-based resources.

Collaboration between the different systems provides the strategy for social change and involves the collective interests of various groups within the community. Coordination of the resources and assets is crucial for effective intervention. Coordination is the key to effective resource deployment, based on different strengths of the various parties.

Effective collaborations are characterised by building and sustaining relationships with clear roles and expectations among the various parties: government as well as non-government bodies.

To build resiliency is to foster community ties by enhancing the social network, together with resource and organisational linkages. Increasing social participation as well as developing a strong sense of community are important strategies (Huang, Tan & Liu 2015). Capacity building of community support on a practical level means increasing not just connection but also growing the trust in neighbours, community and social as well as public institutions.

Resilience and Vulnerability

Social resilience is multidimensional. It cuts across all age groups and layers of society; and can be viewed at national or macro level, and the individual, family or micro level. It is linked to the lifespan of individuals and across the generations, sub-groups and communities. Building robust societies necessarily means having robust and strong individuals and families. Where individuals and families are able to weather difficulties and stay intact and supportive, they are able to develop and grow and be more productive and inter-dependent. At some point in time, crisis and vulnerability such as illness, loss of employment or other stresses will befall the individual or family. At such times, everyone needs support to get back on one's feet.

Social support and social networks are vital for resilience. Risks are heightened, when there is a lack of support from one's social network. Thus resiliency and vulnerability, both resulting from the social, political and economic structures in a society, can reduce or increase risks and proneness to hazards, where vulnerability is defined as "the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards" (ISDR 2005).

There are various forms of vulnerability: environmental, economic and social (Wisner *et al* 2004). Examples of environment vulnerabilities are communities living in low lying areas that are more prone geographically to flooding, just as those near arid bush lands are more susceptible to bush fires (Wisner *et al* 2004). Low-income neighbourhoods or depressed economies are exposed to economic vulnerabilities. Gillespie (2008) identified social risk factors like those of environmental vulnerabilities; the elderly, young children, and low-income communities are at greater risk. At-risk populations have less access to resources and opportunities and greater negative outcomes in physical and mental health.

Assessing resiliency is not about singling out the one risk factor for vulnerabilities and social problems. Usually, there is an accumulation of numerous factors that causes social disorganisation and social problems; though sometimes like the last straw that breaks the camel's back, a single precipitating event appears to trigger the crisis. Social support and social resources are key factors in predicting resilience and recovery from adversity (Norris & Elrod 2006). Where social support and resources are lacking, it is more difficult to recover from losses and crises. Conversely, the presence of support and resources augurs well for recovery.

It is in the bolstering of resources that wellness is promoted, and individual and community resilience facilitated. Creativity and sustainability require both innovation as well as problem contextualisation. Each one of us deals with crises in unique and culture specific ways, and the availability of resource also differs from individual to individual. Better access to and use of resources, internal skills, and capacities mean better social functioning. Multi-collaboration and increased choices may enhance creative coping in the face of crisis.

Enhancing personal resources such as social support, skills, and knowledge, as well as having savings and insurance lead to increased resilience. Healthy lifestyles, an optimistic personality with a positive outlook and personal fulfilment helps protect one both socially and psychologically (Cohn & Fredrickson 2009). Widening opportunities, greater access to resources, people and social participation reduces social vulnerability. Singapore has shown that over the years, at the heart of dealing with crises and disasters, the human connection provides hope and support, and is often the social capital that is needed to overcome all odds.

Social Capital and Overcoming Crisis

Social participation is the vital ingredient for building social capital. You do not go to the movies, eat at hawker centres, or bowl alone (Putnam 1995, 2000). You have in you a certain community spirit, a togetherness or bond with others, and that keeps you all knitted as one. Social capital is embedded in the networks, norms, and social trust inherent in social relationships, and is wrought through interaction with others and collaboration with various organisations (Kretzmann & McKnight 2005; Putnam 2000).

Social capital is made up of bonding capital and bridging capital (Putnam 2000). Bonding capital speaks of cohesiveness as a group, while bridging capital refers to how the group relates with the outside world. It is in finding the connections and being part of a community as well as networking across groups that yield individual success.

This stored social capital also determines how societies can progress and achieve harmony. It involves getting to know and caring for others; it is the reaching out to neighbours that makes life more meaningful. And different communities working together build the nation. The need for bonding capital is met by increasing the capacity of group members to promote togetherness, cohesion and wellness.

So how do we enhance bridging capital? It is brought about by building bridges across groups and sub-cultures, and availing resources to each other so as to meet specific needs. For example, greater understanding of people from different cultures enhances the sense of security and the need for community. Bridging capital grows with the provision of culturally appropriate structures that can connect people and bring together various groups. Community centres, playgrounds, and even markets that are culturally sensitive and promote social interaction between different groups are helpful for community building. Common spaces for mutual participation, whether through void decks, schools, military or workplaces, yields bridging capital.

In coping with crisis together, common bonds are built. Resilience is not just about surviving. One can be stronger and more resistant after healing from a crisis. It is like developing a Teflon-coated personality where problems you may encounter have no or little permanent effect on you. Experience in coping with current problems is also helpful for one to cope with future crises.

In our study of the Ya'an Earthquake survivors, respondents said that it was not economics alone, but the sense of community that was the strong mediating factor for coping with the disaster (Huang, Tan & Liu 2015). Being part of a community is important for one to recover both economically as well as socially. Often it is in problems and disasters that we find our strengths and courage, where we identify our common humanity. For example, we can grow in greater solidarity when we pull together, whether it is in combating SARS or dealing with potential terrorist threats (Tan 2009). Crises become the opportunities for growth and positive social change. We can learn from the Chinese idiom 以灾得福: "that out of disaster gain blessings".

More than being colour blind, we seek the appreciation of different ethnic groups and find solace that we can accept and even be enriched by these differences. It is clear that social skills are necessary for harmony. Cross cultural competence and an open attitude is a key skill required, not just to thrive in present society but also for living valiantly in the future. We must not just tolerate differences but actively cultivate cultural intelligence (Plum 2007) to bridge any cultural divide. The key to crossing cultural barriers is to develop awareness and exercise good values and demonstrate practical skills (Plum 2007).

Community Resilience and Social Solidarity

In the face of social change, building resilience overall means finding ways to enhance our ability to anticipate risk, limit the impact of setbacks and crises, and bounce back quickly. The goal is more than simple survival, but to adapt, learn and grow (Community and Resilience Institute, 2017). In this regard, community resilience is the sustained ability of a community to utilize available resources to recover from adverse situations. By implementing a community resilience plan, a community can gather purposefully together to overcome a disaster, rebuild their community.

Resilient communities are not only prepared to help prevent or minimise loss or damage to life, property, and the environment, but they are also able to return citizens to work quickly, reopen businesses, and restore other essential services without delay, and to rebuild the social life their community needs for a timely economic and social recovery. A good community resilience plan should actively engage the community in learning from a given disaster, as well as in building from the experience of rehabilitation. Included in the plan is the distribution of volunteers, and access to the knowledge needed to rebuild (Sharifi 2016).

To build collective resilience, "communities must reduce risk and resource inequities, engage local people in mitigation, create organizational linkages, boost and protect social supports" which requires planning but also flexibility in decision making as well as timely information that help the community face of unknowns (Norris *et al* 2008:1).

Is what is good for one necessarily good for all? Conversely, should we impose what is good for most people on the minority who may be disadvantaged by it? Durkheimian morality posits that for social solidarity to occur some regulation of morality is needed for the common good (Durkheim 1997; translation). Social solidarity, to me, is the ability to seek common good and yet fend for the weakest. This is what great civilisations are built on. When even the least of the members suffers, all are affected. In complex modern societies, it is inevitable that some members are left out, or even marginalised. Let us be especially mindful of those who cannot hit the mark because some time, somewhere, we may find ourselves to be in the same situation. We should treat one another well, and safeguard others' interests, ensuring that 'no one is left behind'. It is in unity that strength is found.

In the next millennium, with greater economic, social and psychological strains, life will be more challenging and competitive. Caring for the neighbours, whether they be the ones living next door or in surrounding countries, will certainly promote greater goodwill

and bring peace. To be future ready, we need to be resilient so that we can, weather the global storms and challenges together. To become a truly developed nation with a strong civil society, we must learn to be more compassionate and giving. This generosity of spirit, what PM Lee Hsien Loong (2016) spoke of, is needed for greater social solidarity.

If given the choice, most people would choose to be in a place that has resilience as its hallmark; a place that is peaceful and socially inclusive. No country in the world is exempt from disaster – but a society that accepts you as you are and helps you move on in life, I believe, that such a place would afford you the best home on planet earth.

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Chapter 7

Early Childhood Education: Redressing Old Assumptions, Uncovering Myths

Sirene LIM and G. KAVERI

Introduction

At age 65, Robert Fulghum revisited the Kindergarten Credo he wrote thirty years ago – *"All I really need to know about how to live and what to do and how to be I learned in kindergarten. Wisdom was not at the top of the graduate-school mountain, but there in the sandpile…"* (Fulghum 2004).

Fulghum then listed some important lessons children acquire during playtime in kindergarten (and how these are applied in later life). Children are taught to share, to play fairly, to clean up after themselves and return things to where they belong, and of course to exercise basic hygiene such as washing hands before eating and flushing the toilet after using it. Young children learn these most elemental life lessons in preparation for the challenges that lie ahead.

In Singapore today, our educational priorities for children are overshadowed by what we deem to be more progressive and advanced needs – academic learning and test taking. In our anxiety to give our children the best chance of a bright future, we focus on the narrow goals of academic learning and preparation for school rather than *preparation for life* – nurturing test-takers rather than citizens.

To support those trying to navigate the sea of parenting and educational advice, we seek to answer two questions:

1) What do we actually know about young children as learners and human beings?
2) What can we do to revise some urban myths about what young children need from us?

Evidence suggests that young children, babies included, are more motivated and attuned to learning than given credit for. In this chapter, we outline what scientists are learning about how babies are naturally capable of learning and thinking, often in self-initiated ways.

We are born learners (nobody needs to force us to learn)

The brain is the control centre for all our feelings, thoughts, and actions. For decades, scientists have been experimenting with different methods to learn more about this very complex organ and how it works. Cognitive scientists have now gathered sufficient evidence for a key finding about how the human brain develops – from the moment of birth, infants are learning about themselves and what they are experiencing even though the size of an infant's brain is only about 25% of an adult brain. Despite being small, a baby's brain is functioning at twice the rate of the average adult brain. Babies use more regions of their brain to make sense of the world around them, partly because it's new to them and they are eager to figure things out (Gopnik 2009).

Put yourself in their booties to see what interests them:

- What am I doing here? What is this place?
- Who are these people? What are they doing to me? What should I do?
- I've never felt this way before. What is it? Why do I feel this way?
- What is this thing that you're sitting on that I cannot reach?
- Why can't I eat your food? (It looks nicer)
- What happens when I drop the spoon? And if I drop it again, and again… and again?
- What did you just say? (I love that sound) Let me try and say it too…
- I can't reach that. Let's see what I can do…
- I wish I could tell you just how happy I am; can't you tell?

We ask ourselves these questions sometimes, especially when faced with new situations or unfamiliar surroundings. For babies, everything in the world is brand new and everything about their own bodies is a mystery to them. Every baby is naturally inclined to proactively create their own hitchhikers' guide to our galaxy.

However, we know that babies do not just passively absorb information when they learn, they are constantly observing, generating hypotheses and connecting lots of dots. Alison Gopnik and her colleagues had this to say –

> *"… babies and young children know and learn more about the world than we could ever have imagined. They think, draw conclusions, make predictions, look for explanations, and even do experiments. Scientists and children belong together because they are the best learners in the universe. And that means that ordinary adults also have more powerful learning abilities than we might have thought. Grown-ups, after all, are all ex-children and potential scientists…"* (Gopnick *et al* 1999 viii)

Each time you peer into the crib, remember that the baby is also staring back at you to gather data and to make sense of that moment in relation to other moments that happened a few hours or days ago. Similarly, when young children play, they are actively experimenting and using those results to develop a causal map of the world around them or to change the way they think. This is what "learning" is all about. As humans are adaptable to change, young children learn about people and about themselves, which can change their beliefs, desires, feelings, motivations and interests.

A baby's brain is more highly connected and attuned to discover, imagine and create, while an adult's brain is more efficient because of the filtering process that occurs in middle childhood. Use it or lose it – while this could have some truth in the brain building process, we also know that brain wiring can be changed with determination and learning throughout our adult years. What we learn in our early years can shape our interpretations of new events and new people that we meet later in life.

Babies are scientists and philosophers (not blank slates)

Older scientific theories maintain that the development of children follows a process of maturation and often takes place in a universal, linear fashion without regard to cultural or environmental influences. Young children were not only irrational, they were also amoral and egotistical until higher-order skills are developed in middle childhood.

Evidence in cognitive science suggests that children, before their second birthday, are hard-wired to learn by exploring; they can exercise their imagination and sharpen their problem-solving skills; and very young children do develop a sense of fairness, sympathy for others and understanding goals (Gopnik *et al* 1999).

Are babies logical thinkers? We now know that very young children have the ability to explore causal relations in both the physical and psychological realms. Babies are self-directed learners who not only learn about how things work in the physical environment (i.e., what dad's voice sounds like, how a door opens, that leaves rustle in the wind, what water feels like); they also have a basic understanding about emotion and action (i.e., what happens when you smile at dad and why he doesn't always respond). Some experiments were conducted to find out if babies could discover a new use for an object, or invent a new tool (Gopnick *et al* 1999).

One such experiment involved placing a familiar and well-loved toy out of babies' reach and placing a toy rake beside it to see if any child would use the rake to help them retrieve the toy. Fifteen-month-olds sometimes picked up the rake but didn't know how to use it to reach the toy they wanted. But many of the older children looked at the rake, paused to think up a plan, and were able to successfully use it to draw the toy toward them. After close observation, the researchers were quite certain that older babies were capable of imagining solutions and possibilities rather than just relying on simple trial and error. Other studies also reveal that younger babies can solve similar problems thoughtfully if given the right kinds of information.

Are babies born with morality and love? No parent living daily with cries of 100 decibels needs to be told their baby has a temperament and an emerging personality. Scientists are also uncovering more and more robust evidence that babies are fully human in many ways and hungry to learn about the seemingly abstract concept of love and human relations. Yale scientists found 6- and 10-month-olds choosing "nice" characters instead of "mean" characters from a series of puppet plays; and toddlers were found to be natural helpers with the propensity to comfort others who were upset.

Through a host of creative experiments around the world, scientists have been surprised at how young children often respond spontaneously to others who need help. Are babies hard wired to identify "good" and "evil" or do they learn this as a result of their own experiences over time, or must an adult teach them explicitly? While scientists are uncovering new evidence, there is no conclusive explanation yet about how they actually learn all this on their own.

Unpacking Urban Myths

With our current understanding of how ingenious and capable young children are, what do we do about nurturing these strengths to ensure they thrive in an uncertain future?

There has been a considerable accumulation of child development and learning theories. However, we must remember that theories are borne out of a particular time period and cultural context with certain norms, beliefs and trends. Learning theories generated in one part of the world may not be universally relevant. So with new scientific evidence emerging about how the human brain develops, we need to take a step back and evaluate what we know and see if our actions are in keeping with new evidence.

Let's unpack some of the urban child-raising myths found in Singapore.

Myth 1: Genes determine our future

The short scientific response to this myth is "no."

Genes may provide the blueprint for the formation of brain circuits, but the brain also has the ability to modify itself in response to experiences from birth and through adulthood. Brain development is integrated with emotional well-being and social development, as well as being the foundation for language learning and higher-level thinking skills.

At birth, a baby has a larger stock of neurons than s/he will ever need but this ensures that the brain will be fashioned quite flexibly to fit her/his unique daily experiences. In the first 2 to 3 years, the brain seems to generally develop from the bottom regions upwards – starting from the brain stem which controls basic functions like body temperature and heart rate, sensory pathways including vision and hearing, followed by language skills and higher cognitive functions.

All-round development in those early years (i.e., physical, emotional, social, cognitive and linguistic) is, therefore, important for later success in school, workplace and community and this is highly dependent on what the adults around the young child say and do, rather than determined by the family's socio-economic status or parents' education levels.

Brain wiring is nurtured when adults respond and interact with infants. For example, a baby left lying for hours on her/his back with no stimulation or human interaction can experience higher than usual levels of stress. Sustained stress harms areas of the brain that are dedicated to higher-order skills and could lead to lifelong challenges in learning, behaviour, and physical and mental health.

Myth 2: There are limited time periods for learning to take place

The scientific response to this myth is closer to "no" than "yes."

Marketers of early learning programmes for babies often exploit the so-called "critical periods" or "sensitive periods" to make us feel compelled to help babies read before it is too late. However, neurologists have found that very few brain structures require such restricted time periods for neural sculpting to take place (Gopnik *et al* 1999):

- Vision. For proper development of brain structures that process vision, a newborn baby must receive light within the first months.

- Organisation of speech into coherent patterns. During the early months of infancy, babies need to hear human speech in order for the brain to activate circuits of neurons to organise speech sounds.

The issue of critical period for language learning is still hotly debated. Some scientists believe that a child should listen to distinctive sounds in a particular language (e.g., the r's and l's in English) before puberty or s/he won't be able to discriminate them later. Other scientists believe that being exposed to languages early in life can make the brain less flexible later because the brain's representation of sounds becomes more well-formed and fixed so it becomes more difficult to perceive a wider range of language sound systems.

To date, there seems to be no further evidence of a narrow and fixed open-shut window period for other areas of development.

Myth 3: Play is a waste of time and could pose unnecessary risks

The scientific response to this is "no."

When young children play they engage their whole body and enjoy themselves. This type of active play has benefits for healthy brain growth. When playing, children learn how to regulate behaviour and emotions, become physically healthy and quite adept and controlled at using a range of motor skills (e.g., walk on different surfaces, run at different speeds, jump, climb, throw, bend, catch, push, pull, carry, twist, fold, cut, balance). Researchers have found that healthy physical development is not guaranteed through natural maturation, at least not in urban environments. Instead, the development of motor and sensory skills in children depends upon their environment and what adults choose to have them do. If we are constantly hovering over children, afraid that they will fall or graze themselves, they will sense our fear and anxiety, and not be willing to take risks during playtime. If they are unwilling to take risks through play when they are young, when will they develop enough practice to take greater risks later in life?

A child's brain gathers information about everything they come into contact with through

their senses during their first years. For instance, during baby's first year, s/he develops a preference for certain types of objects and surfaces (Schneider 2009). If we aim to nurture versatile and flexible human beings, this means that when babies are younger, they ought to have enough experience with manipulating a range of objects (e.g., ordinary things around us like containers, fabric, utensils,) and a range of textures (e.g., smooth, rough, wood, plastic, metal, sheer fabric, woolly fabric, paper, flour).

Indeed, evidence suggests that physical activity in the early years doesn't just enhance a child's physical fitness, it increases her/his attention span and improves concentration and focus, an important skill for school and for life. In contrast, studies also show that three-year-olds who are not encouraged to move about and engage in physical activity are likely to become obese in later childhood and as adults (Dehghan *et al* 2005). Despite our assumptions that the typical pre-schooler is often one found whizzing about, some children in urban environments are becoming more sedentary. Researchers have found that children enrolled in urban preschools spent about 90 per cent of their playground time on inactive play behaviours even when they had a choice to be active (Brown *et al* 2009).

Obesity in Singaporean school children has risen from 10 per cent in 2000 to 11 percent in 2013 and to 12 per cent in 2014. Children also go through a predictable cycle of holiday weight gain followed by school time weight loss due to physical activities in school. The danger is that children living a sedentary lifestyle in Singapore will develop more serious health problems as adults (Khalik 2016). Childhood myopia can also be delayed when children are outdoors daily (Wong 2016).

Myth 4: It's the 21st century! We need new products and technologies to prepare children for the future

The current scientific response is "no."

Consider basic research evidence on two readily available child-raising products in the market (available on CDs, DVDs and mobile applications):

- Mozart Effect. The original research had very narrow findings because the researchers had conducted their study with university-aged students and these researchers never made any claims that listening to Mozart made people smarter. In the study, the students that listened to Mozart performed better on a spatial reasoning test but the improvement effect was temporary and wore off after 15 minutes.

- Baby Einstein. This set of videos has been marketed as a way to introduce babies to different sights and sounds. In "Baby Wordsworth," for instance, a group of 30 words is highlighted in the video for babies to learn. At the end of six weeks, researchers found no difference between babies that watched the video and those that did not. In fact, they found that the younger a baby started watching a Baby Einstein video, the lower his/her language scores. This is not surprising because passively watching a screen does not activate much brainwork. A baby's brain is wired to grow and learn by interacting with people and manipulating objects around them.

Baby Einstein and Mozart Effect are but two examples of edutainment aimed at addressing parents' fears of under-development in very young children. Together with flashcards and other products, they contribute to the emergence of the most recent billion-dollar baby market.

The findings of The Early Childhood Parenting Landscape Study (ECDA 2014) revealed that 36% of parents enrolled their children in enrichment classes and more than 80% used technology with young children. Raising a successful child in today's world does not require special technology, toys or other products because we know that the brain is a social organ thriving on basic human communication and daily social experiences – conversations, stories, gestures, demonstrations, walks, hide-and-seek, doing things together, holding the lift door for a neighbour, helping granny with her grocery bag, exchanging words of encouragement. Children's brains are built on an accumulation of these many mundane moments each day. While toys and tablets have a place in children's lives, they play a supporting role in parenting and educating.

Myth 5: Children must be taught explicitly how to learn

The scientific response to this is more "no" than "yes."

While some skills in life require some explicit teaching from adults (e.g., handling tools and equipment, social manners), a child's brain is primarily shaped by social interactions and self-initiated explorations and discoveries. They don't need adults to be overly-directive.

When children think they are being taught, they are more likely to reproduce what the adult has told her/him because it must be the right technique and there's no point trying something new. This is the danger of explicit teaching. We discourage a child from trying things out and getting things wrong.

Young children need to learn independence in all areas of their daily life as soon as possible. If we keep spoon-feeding, carrying them or putting them in strollers when they are able to walk, they become overly reliant on adults to do everything for them. Similarly, they need to learn to exercise choice, take risks and learn from their mistakes early in life so that they have sufficient practice by the time they need to make more complex decisions or solve problems.

The irony of urban life is that while parents have less time to spend with their children, they have more money to spend and hence, are in danger of over-structuring a child's learning and development. An American sociologist has termed this kind of parenting practice as "concerted cultivation", which is found among middle-class families who pack their children's schedules with afterschool tutoring, organised playdates, performing arts and/or sports activities (Lareau 2011). Over-structuring a young child's learning is unhealthy in the long run if we want to develop a thinker, and a responsive and responsible citizen.

Underlying such overly-instructive practices is an assumption that young children are defective versions of adults when they actually have equally complex and powerful minds, brains and human consciousness. Why is it then that, compared to young animal species, human babies spend far longer being seemingly "useless" and highly dependent on adults? Alison Gopnik (2009) argues that they just have different evolutionary functions than adults. Young human beings spend a longer time being highly dependent on adults because they need a lot more time for more complex learning to take place.

Human civilisation has a lot of accumulated knowledge and as a species, we need to continually depend on imagination and other high-level thinking processes to invent tools and generate knowledge. Therefore, childhood is the protected time in which young children need not worry about hunting and gathering to feed themselves but can spend all their days practising their observational skills, figuring things out, exercising exploratory skills and imagination through playful activities. In contrast, adulthood is when we become better as rule-followers, planners and implementers but we may also lose some of our earlier inclinations as visionaries and creators.

Concluding Thoughts

Babies are born motivated to learn, to move and are naturally imaginative and logical thinkers. It's certainly unfair and unwise to straightjacket a child's mind into the narrow confines of the traditional 3Rs (reading, writing, arithmetic). It's certainly too late to only encourage critical and creative thinking in their teens having spent years not practising those mental processes. If young children are curious about what's around them and how

things work, we must support that curiosity and build on what's already on their minds even if they have limited language.

玉不琢，不成器。人不学，不成行知义。(yubuzhuo buchenqi; renbuxue buzhiyi) – this is a Chinese saying about how a piece of jade has to be processed before it can become a useful tool. Similarly, a human being needs to engage in a process of lifelong learning to be continually useful to society. The ECDA parenting survey did reveal that more than 90% of parents desired to raise useful citizens. We could redesign schooling to begin with the end goals of citizenship and participation in communal living instead of designing curricula to begin with what many children deem as de-contextualised and abstract ABCs and 123s. We could flip the order in which we usually work with children – instead of beginning with the traditional 3Rs (reading, writing, arithmetic), we begin with what each child is curious about and we develop the 3Rs of resilience, risk-taking and self-regulation instead. We would need to trust that these new 3Rs will provide a foundation for academic learning because children do not need to be forced to learn, but rather have a good reason to learn.

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Chapter 8

Ageing Society: Implications for a New Social Compact

Kalyani Kirtikar MEHTA

Introduction

In 2001, then Prime Minister Goh Chok Tong introduced the concept of a Social Compact between the government and the people (Policy Digest 19/01 2001 p1). He described the social framework as an 'enduring social compact' in which the government ensures that every person is given equal and maximum opportunity to advance, with a social safety net for the minority who cannot cope. This chapter raises the question whether such a social compact between the government and the people remains relevant today. With a rapidly ageing demographic profile; where one out of every four people will be 65 by the year 2030; and the percentage of those unable to cope increasing steadily, pushing beyond what we would refer to as a minority, it is arguably important to revisit policies of more than a decade ago, to see if they are still applicable today.

From a gerontological perspective, higher percentages of older people in the population would call for more medical, social, housing, and legal adjustments to be made at the policy and societal levels. Moreover, family structures and composition have also changed. For example, there are more unmarried residents today, as compared to a decade ago (Population Trends 2016:8). Existing policies may not need a total revamp, but they deserve to be tweaked for political or economic reasons. The remaining sections of this chapter will discuss the social trends and unmet needs of Singapore today, and propose a more effective revised social compact.

Family Structure and Characteristics

There is much literature on the importance of family support for older persons (Chan 2007:188; Teo, Mehta, Thang & Chan 2006:120). The recent PATAS survey (2013) on attitudes and perceptions towards ageing and seniors found that 96.5% of respondents between 50 and 74 years of age indicated that family is an important source of support for the elderly. This is not unique to Singapore, as research scholars from other countries have reiterated the same (Thomese & Cong 2015; Hooyman & Kiyak 2011).

However, in countries where co-residential living arrangements are decreasing (e.g., Japan), there is a general perception that filial piety is eroding slowly (Usui & Tsuruwaka 2012). Knodel (2014:48) pointed out that a decrease in co-residential living arrangements may not lead to an erosion of filial piety, as the adult children live in geographical proximity and therefore would be available to provide support. In many cases, they are providing and receiving support, or have bi-directional family assistance of various types.

It is clear that family support is critical for the wellbeing of seniors. Family support, social networks and mental wellness have a close connection to one another. Donaldson and colleagues (2015:11) confirmed the link between social networks and mental wellness in the Singapore population:

> *"Overall, the strength of social networks was found to be the biggest determinant of mental wellness. While some people with poor social networks still scored quite well on both measures of mental wellness, there was an overall linear relationship such that few social networks led to poor mental wellness, and strong numbers of social networks led to good mental wellness."*

Therefore, the increase in elderly living alone from 6.6% in year 2000 to 7.7% in 2005 (State of the Elderly 2008/09:6) is of concern to policy makers and those involved in the ageing service sector. Similarly, the increase in elderly 'living with spouse only' from 13.9% in 2000 to 17.4% in 2005 is a significant change (ibid). Social isolation in old age is an 'environmental hazard' leading to risk of depression and poor mental health. Hermalin, Ofstedal and Mehta (2002) asserted that 'living alone' is likely to create stark vulnerability in old age due to higher chances of loneliness and poorer physical and mental health.

Asian Context

With increasing longevity, the family structure is taking on more of a beanpole design than a tree. It stretches the adult child-parent relationship over multiple generations. However,

this social change is occurring faster in developed and developing countries than the underdeveloped: Japan, Korea, Taiwan, and Hong Kong are 'ageing' more rapidly than Malaysia, Indonesia, Philippines, and Vietnam. While filial piety appears frequently in the literature as a cultural determinant of continuation of family care for the seniors (Ikels 2004), some scholars predict that governments will have to revisit their policies, as social forces may pose obstacles for the Asian family to provide adequate care to vulnerable seniors in the future (Chi, Chappell & Lubben 2001).

Two points need to be clarified at this juncture. First, filial piety is not confined to the Chinese ethnic group, although the concept may have emerged from there. Singapore is a multicultural, multiracial society and research has uncovered that filial values pervade the Indian and Malay cultures also. Second, seniors are not always care recipients, they are also providers of care, and therefore a life course perspective is appropriate when family care is the focus of discussion.

Multiple factors suggest that the trajectory of care for elderly in the family will be very different as compared to two decades ago. Some of these are higher education and workforce participation of adult women, seniors choosing to live on their own, higher standard of living, and spiralling costs of transport, education, leisure, and food. In addition, longer life expectancy implies longer years of care provision, and parallel ageing experiences of caregiver and care recipient. This would lead to higher levels of stress, and caregiver fatigue and burnout.

The 'cultural script' and parental expectations would prompt adult children to be motivated to provide care when needed, in sync with the needs of the ageing parents. The shrinking family size, demands of the growing children of the family caregivers, and increasing medical expenses would aggravate the situation to the point wherein the adult children/spouse would consider outsourcing the care, for example, to an elder day-care facility, a foreign domestic worker, or an institution. What is the role of the foreign domestic worker in an ageing household? Mehta and Thang (2008) discussed at length the blurring of boundaries when work and caregiving roles and responsibilities interface within the home.

Past research has documented a wide range of family experiences. At the micro level, qualitative research has uncovered the mental, emotional, physical, psychological and spiritual domains that caregivers traverse, with positive and negative consequences. Even in the long-term caregiving stretching over 15-20 years, the strongest of caregivers will stumble. In focus groups I facilitated in a research project on family caregivers in Singapore, I was surprised at the emotional outpouring that occurred, ranging from anger, guilt, fear, frustration, exasperation, and cries of desperation over

future challenge anxieties. I admired the fortitude of the caregivers in the face of challenging situations not just within the family arena, but also the dehumanising medical system, the red tape of bureaucracy, rigid infrastructure, and seemingly unhelpful technology.

Some verbatim quotes from my focus group discussions are provided below:

The single caregiver's default appointment
"I left my job to look after her full time initially, with the help of the Alzheimer's Association here, which she attends initially. She attends daily from Monday to Friday for her day care. But after her fall recently, I cannot cope to look after her by myself, so I have to employ a maid to look after her. So she now attends twice a week in the day care, the rest of the time, me and the maid look after her. I look after my mother because I'm single and I am alone, so the responsibility's on me. I have a brother and a sister but they have their own family to look after."

The married caregiver's dilemma
"And so I find myself caught, like, so parents first or spouse first? You know that kind of thing? And it became a struggle at one point in time. And for me, it was like, yeah, my parents first."

A working caregiver
"And I'm always late for work. But I think that I've been marked for being late. So now they put me right under the head of information technology, say, 'Keep a watch on her'. But I hope the employer will be more understanding. Perhaps they look at it as discipline. They tell us, 'How can come late to work?' I think they don't quite understand."

Trajectory of caregiving
"I find, firstly when the person falls sick, I'm not just talking about myself, but from my experience, the love that we have for the person is at 100. But over time, it goes down and down and down, especially when the old person couldn't even recognize you or become extreme. Usually, an old person goes to hospital or something, everybody rushes there, the relatives, everybody, so our love for the person may be 100%. But over time, sadly speaking, the relationship goes sour because we are giving and giving but the person may not be reciprocating. Because the person gets more insecure, demanding, frustrated, depressed and physically more needy."

Financial challenges that caregivers face
"I think the first difficulty and the most important for me, was money. Because their Pampers was very expensive; the medical was expensive. And when my parents were alive, I would call the private doctor downstairs because I lived on the level that the flat does not have a lift."

Since 2013, when the findings of the Informal Caregiving Survey (2013) were released, there has been a significant effort from the part of the Singapore government to provide education, training, and support for family caregivers. The Caregiver Training Grant of $200 per annum has facilitated more family caregivers (including foreign domestic workers) to attend workshops and talks (e.g., on how to care for someone suffering from dementia). However, is this enough? Are the resources and services meeting the real needs?

Chin and Phua (2016) argued for the urgency to address the needs of family caregivers. Caregivers looking after depressed or dementia patients with no respite have expressed that the night-time caregiving is very exhausting. Placing an elder family member in a Community Hospital or a Nursing Home, is very expensive. Financial burden of care for a parent who has no insurance or savings can be heavy for adult children, especially when it involves a single adult child who is also an only child.

Social Compact Revisited

Since 2005, the Singapore government has monitored the changing demographics very closely, and is beginning to place greater emphasis on the expansion of community eldercare organisations. The Ministry of Health and Ministry of Social and Family Development have encouraged voluntary welfare organisations and private nursing homes to grow their services for older persons, including those having dementia, through funding such as Community Silver Trust fund, and Silver Support Scheme, as well as simplifying related governmental processes. Other efforts are by statutory bodies, e.g., National Council of Social Service (NCSS) set up the Eldercare Network to improve collaboration and sharing of best practices among service providers. Forced by the changing societal circumstances, the slow paradigm shift from a heavily family-based senior care to a more balanced one in which the community also bears part responsibility is taking place in the Singapore approach.

Seniors generally like to 'age in place', i.e., living in their own home, for as long as possible. Beyond physical needs, elders have psychosocial needs too, such as wanting a companion to bring them for hospital check-ups or in case of an medical emergency. A particularly challenging and very real scenario is one where adult children have migrated overseas, leaving the ageing parents in Singapore, who may have been active seniors at the time their children left, but now need close and urgent support. In recent years, the increase in ageing couples living on their own, sometimes with a foreign domestic worker (if they can afford one) is evident. The social compact of the government with the society is brought to the forefront in such cases.

A good example of a recent government measure, implemented in late 2014, is the Pioneer Generation (PG) scheme. It represents a tweaking of the social compact, to take into consideration the pioneer generation's sacrifices in helping to build Singapore to what it is today, and the high probability of medical and financial constraints in old age. The government set aside 8 billion Singapore dollars to provide for their health (including dental) care, with subsidies and Medisave top-ups for life. Fifteen chronic conditions and thirteen dental conditions are included in the subsidies. A PG Disability scheme was also introduced, under which pioneers with moderate or severe disabilities could apply for cash assistance of $1,200 per year to help defray their care expenses.

The important noticeable change from earlier policies is that the eligibility of a pioneer was defined by age and year of citizenship, and NOT by the pioneer's income level or housing type. This was a deviation from the 'means testing' rule imposed on most subsidies in Singapore. The PG scheme design represents a rare policy that takes into consideration life course effects of an entire generation, one that lived through the after-effects of the Second World War (Mehta 2015). The government has confined the PG scheme to that generation as of now, but it does not preclude an expansion or replication of similar schemes in the future.

Other examples that reflect the changing social compact are the Medishield Life scheme and Silver Support scheme. (For details, visit https://www.moh.gov.sg/content/moh_web/medishield-life/about-medishield-life/what-is-medishield-life.html, https://www.silversupport.gov.sg, and http://www.mom.gov.sg/employment-practices/silver-support-scheme). It should be noted that Medishield Life applies to all Singaporeans and Permanent Residents, while the Silver Support scheme, a social safety net for the elderly poor, is restricted to Singapore citizens only.

From the three examples above, we can see a gradual shift in national social policies. It is possible that policy makers are realising that the social compact described by PM Goh Chok Tong (2001) is not entirely suited for the changing demographics of Singapore,thus prompting the response; the Silver Support scheme testifies that the government will not leave the poor stranded. Another way to view this shift is to recognise that we, as a country, are becoming mature not only in terms of our population but also in terms of our understanding of people's needs.

In a recent symposium of the International Consortium of Social Development (ICSD) held at SIM University (now renamed Singapore University of Social Sciences) in July 2015, Deputy Prime Minister (DPM) Tharman Shanmugaratnam made the following statement in his opening speech:

"It is about a compact that both strengthens what we aspire to be collectively and encourages and rewards personal and family responsibility. That compact is being reinforced through all our social policies in Singapore – from interventions in the early years to helping those who start with less, to helping every individual develop through education, to home ownership for all, to enabling everyone to work and contribute to society in their own ways, to enabling second and third chances in life, and to helping families look after our seniors.

Our whole approach must be to empower people and empower aspirations. Never leaving people to fend for themselves, but keeping that compact of personal and collective responsibility alive."

So how does the compact described by PM Goh in 2001 differ from the one described above by DPM Tharman? Firstly, the earlier social compact between the government and the society at large was mainly a dichotomous arrangement, with the government on one side and the vulnerable people on the other side. The government's commitment was to look after the vulnerable and poor, who are unable to look after themselves. The government's role was to develop a conducive environment for the majority to grow and prosper.

The compact described by DPM Tharman attempts to be more inclusive and speaks about collective responsibility. In an ageing population, when large numbers of people require care the whole society has to be committed to adjusting to their needs and recognising that they have contributed in the past to the country, and so they deserve the whole society's concern (not just the family). However, DPM Tharman states that seniors also have a personal responsibility to prepare for their old age. In an ageing society, intergenerational ties are very important, at personal as well as generational levels. Otherwise, any conflict can create a chasm in the social fabric. Within the mosaic of society, personal, collective, and state responsibilities play a complementary and equally important role.

Professionals working in the community are well aware that the government's philosophy of delegating care of elders to the family as the first line of defence may not be feasible in reality today. This is not due to an erosion of filial piety but the changing workplace expectations, inflation, children's own lifestyle and goals, and finally the older people's reluctance to be a burden to their family. There are many situations wherein family members are themselves ageing due to verticalization of families, e.g., a 65-year-old son looking after a 90-year-old mother, or a 75-year-old wife looking after an 80-year-old husband. As mentioned earlier, due to global trends in migration, adult children may not be physically co-located to care for their ageing parents.

Bearing various scenarios in mind, it becomes necessary to include the community as a complement to family, and volunteers or befrienders to replace family members for personalised care. Nevertheless, where family members are providing care due to their love or relational ties, I contend that more support from the government is critical. Building more nursing homes will not solve the problem. It will only increase the expenses of the family and medicalise eldercare. From the above discussion, it emerges that although we are taking some steps in the right direction, social policy makers are avoiding tough and complicated decisions.

The current practice for the majority of Singapore households is to employ a foreign domestic worker (FDW) to provide physical care, while psychosocial care is the family's responsibility. It is clear that there are risks involved in depending too much on the FDW, and the sources where we drew the FDWs from are drying up. Are sheltered homes and nursing homes the answer? Or, should policy makers revisit the idea of providing a carers' allowance, so that family members can care for the elderly at home? In the past, the argument that care should not carry a monetary tag was applied to crush the idea of carer's allowance. In light of research on caregivers' stress and its negative effects on physical and mental health (Mehta 2005; Mehta 2006), it may be a good time to review this 'sacred cow'. We could adopt a strategy where the elder person is given the choice of how he/she wishes to 'access' care: from a family member, a day care centre, or a home service.

Another tough decision that policy makers are not addressing, as they gradually make the shift in the social compact, is the legislation of 'family care leave' across all sectors. In a nation where families are recognised as the building block of society, employers are willing to give compassionate leave upon the death of a parent but not family care leave when the parent is critically ill!

Recommendations

A key point to remember as we conclude is that the social compact must always be 'work in progress' – it should be evolving and responsive to new circumstances. As a small nation that is dependent greatly on the global economy and labour migration, we are open to the effects of environmental change, conflict and geopolitical movements. Internally, we are also susceptible to the influences of social media, family changes, value shifts, and generational differences.

Therefore, doing deep research for evidence of any local shift in social values across generations as well as impact of technology should be given high priority. Social and

psychological research has been undervalued in the past and so it is good that a Social Science Research Council has been established recently by the Ministry of Education.

A second recommendation is that government agency staff who implement policies be allowed more flexibility to decide on borderline cases on their merit for subsidy. For the creation of a caring society, there should be an underlying philosophy that human beings deserve to be treated with dignity. A compact between the government and the society has its operational dimension; hence, the way it is implemented is as important as its principle.

The final recommendation is that, going forward, the social compact in Singapore should ideally include the state, community, family and the individual; where all four pillars are enshrined as equally important and irreplaceable.

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Chapter 9

Doing Good: Driving Business and Social Excellence

LEE Pui Mun

Introduction

Why is doing good important?

The conscious thought to do good differentiates humans from other forms of life. Humans have the capacity for large-scale destruction but also the inherent ability to help their fellow beings. Throughout history, the teachings from major civilisations have always advocated doing good. The teachings of Confucius, for example, focused on proper individual behaviour in relation to family, fellow beings, and society. Socrates, Plato, and Aristotle focused on justice, equality, and humanity. And, the advocates of all major religions encourage doing good.

At major junctures of our history, humankind has witnessed the disruptive stresses of catastrophic disasters and the breakdown of societies due to countless wars. Many civilisations have, however, been remarkable in their ability to reorganise and continue to progress through these upheavals. Our inherent desire to help one another and to organise supportive relationships forms the social fabric that binds our civilisations and has thus probably averted possible human extinction. It is therefore imperative that the message of doing good is passed from generation to generation. Doing good is – and must remain – a basic fabric of advanced modern society.

How do we sustain this important fabric of society?

Doing good is not about practising holy behaviour or providing saintly contributions to society. Although we should be eternally grateful to the incredible few who have selflessly offered themselves and their means to others, sustaining this important societal fabric requires not the effort of extraordinary individuals but the participation of the masses, in forming positive interactions and creating a civic and gracious society filled with empathy, courtesy, and generosity.

In their Social Excellence blog, Matt Mattson, Jessica Gendron Williams, and Josh Orendi define the elements of social excellence as follows: *"A state of perpetual generosity, curiosity, positivity, and openness to limitless possibility. A desire to intentionally connect with others. The ability to engage in deep, meaningful conversation. Acting in a responsible and respectable manner with high expectations of others, being authentic, and living everyday with integrity as the best version of oneself. Being confident and vulnerable. Being fun and compassionate. Being open, kind, and bold. The deepest level of societal participation and contribution."*

Consequently, social excellence advances the standard of living and enhances quality of life. How then can educational institutions imbue such characteristics in their students and alumni so as to help spread this important message in our society?

Singapore University of Social Sciences

As a university that caters to both working adults and school leavers, the Singapore University of Social Sciences (SUSS) has adopted an education philosophy that focuses on the theme of Head, Heart, and Habit. We believe that university students should not only acquire professional competence and be equipped with a head full of knowledge and technical skills, but that they should also nurture the habit of lifelong and independent learning so as to continuously improve themselves, and cultivate a heart to do good and be compassionate citizens of our society. The university has thus devised activities and education processes that provide students with a learning experience that cultivates our Head, Heart, and Habit ideals.

All students enrolled in our university have ample opportunities to participate in a variety of service-learning programmes offered. These programmes provide them with opportunities to develop civic-mindedness, a compassionate disposition, and a desire to serve and care for the less fortunate. The programmes are very relevant to our students' entire educational experience.

As a university that prides itself on having strong industry relations and infusing industry-relevant practices into our curriculum, we actively incorporate industry models and practices into our curriculum. One such industry-relevant model offered to our students is the internationally benchmarked *Business Excellence Framework,* which is put forward by SPRING Singapore. The School of Business at SUSS offers Business Excellence as a stand-alone course.

The business excellence framework encompasses the ideals of total quality management. Besides being a good guide to professionals on developing effective plans and implementing practices to achieve excellence in business and other organisations, the framework could also be a catalyst to drive social excellence. To envision how to do this, an understanding of the framework is first needed.

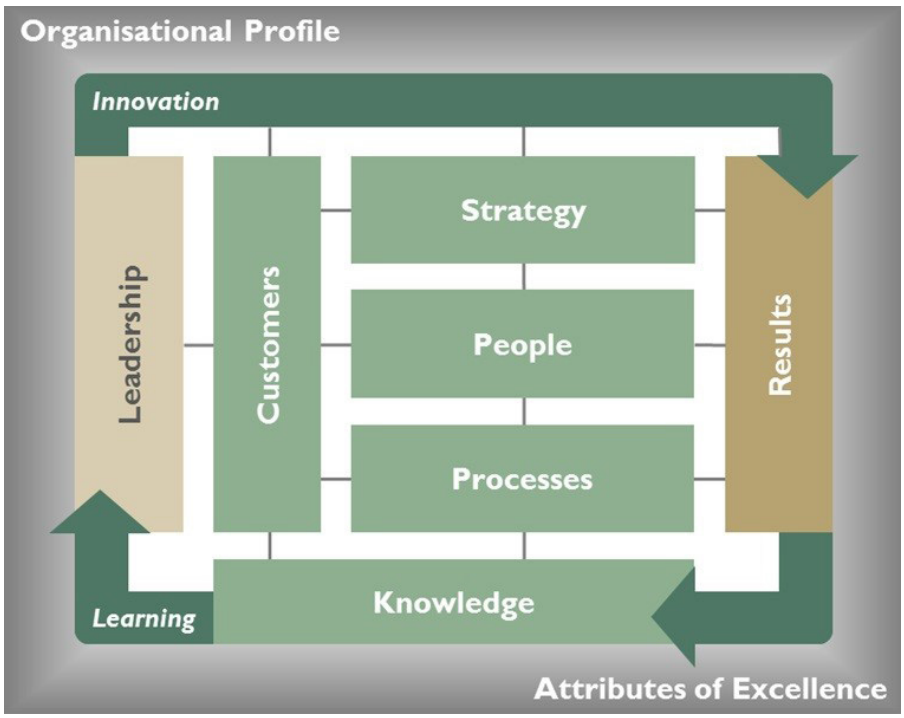
Business Excellence

Framework Overview

The Business Excellence Framework is a roadmap that organisations can use to drive excellence in their businesses. The framework consists of seven criteria: *Leadership, Customers, Strategy, People, Processes, Knowledge,* and *Results* (see Figure 1). Each criterion relates to a relevant functional area, with assigned requirements that organisations must achieve. When an organisation adheres to and achieves what are dictated in the framework, its entire system attains the ability to function synergistically to achieve business excellence.

The seven criteria are arranged to indicate the sequence in which excellence could be achieved. First and foremost, there needs to be effective *Leadership* driving an organisation towards meeting the framework's requirements. Secondly, as in any business, meeting *Customer* needs and satisfying the customer is the key to sustaining the business, and thus it comes right after Leadership. Once the organisation understands how to meet customer needs, it has to direct itself to do this effectively. This is where the organisation has to strategise (as in *Strategy*); it must focus its resources (such as its *People* and its *Processes)* to build capabilities to serve customer needs. The *Results* are the performance feedback that will allow organisations to know whether they are successful in moving towards business excellence. All the above activities do not work in a vacuum, as relevant data and information (classified as key *Knowledge*) have to be constantly made available for the organisation to make informed decisions to implement and execute the right action plans, in order to meet the requirements of each and every criteria in the framework.

Figure 1: The Business Excellence Framework



The Seven Criteria

The *Leadership* criterion focuses on having top management being committed and involved in setting clear directions and visible goals, and in creating and sustaining corporate values and systems for the business and the organisation. It advocates good corporate governance as well as good social responsibility and environment sustainability. When good and responsible leadership is achieved, the business will operate on a strong moral foundation where business success can raise quality of living by meeting customer (or citizen) needs, bringing wealth to its community and its staff, and reinforcing social benefits and sustaining environmental well-being.

The *Customer* criterion focuses on how the organisation determines customer needs, enhances the relationship with its customers, and determines and improves customer satisfaction. A society where businesses can satisfy customers and make them happy will naturally contribute to a better quality of life.

The *Strategy* criterion requires organisations to have short-term and long-term plans that can be executed to help the business to stay competitive. Fair competition among

businesses in the marketplace benefits customers and society. A competitive marketplace produces a wide selection of quality products and services, thus giving consumers a better standard of living.

The *People* criterion focuses on organisational requirements to nurture the full potential of its workforce; the criterion emphasises human resource planning, training and development, employee satisfaction, and employee performance and recognition. When organisations help employees to achieve their fullest potential and to continuously acquire knowledge and relevant skills while rewarding them justly, it will not only help the business but also help to create a better-trained and educated workforce that benefits the entire society.

The *Process* criterion requires an organisation to focus on continuous improvement of its key processes and supplier management, such as the design process, operational and delivery processes, and supplier and partnering processes, in order to create competitive performance that will ensure quality product output and quality services that meet customer needs. When a society has access to good quality products and good quality services, it raises the standard of living and enhances the quality of life.

To sustain excellent performance, continuous organisational learning and innovations are required. This is facilitated by *Knowledge*, which requires an organisation to have a good information system that supports the acquisition and dissemination of key performance data and sharing of best practices among its stakeholders. It also provides a closed feedback loop to drive continuous learning and improvements, and support effective decision-making.

Lastly, the *Results* criterion focuses on reporting the organisation's key performance results, such as customer results, financial and market results, people results, and operational results. Performance results provide the organisation with a clear indication of the effectiveness of its planned actions and also guides the organisation to make changes or fine-tune its strategies and action plans.

As can be seen from the framework design, the seven criteria for organisations require that they create action plans that have to be implemented in all major functions of a business entity, namely, leadership, planning, marketing and customer management, resource management and employee development, business value chain management, information and knowledge management, and business reporting.

What do knowing the business excellence framework and implementing the business excellence roadmap have to do with doing good for society and driving social excellence?

Social Excellence

The objective of doing good is to implement actions that result in meeting societal needs. The first question to ask ourselves is: Are organisations doing good when they achieve business excellence – do they benefit society? The second question is: If many organisations in a society subscribe to the business excellence framework, does it imply that employees in these organisations would acquire beliefs, principles, and habits that are derived from the positive discipline and framework-driven ideals? And would they therefore be able to practise them outside the organisation and in society, thus enhancing social excellence?

Business excellence requires enlightened leadership embracing social responsibility and environmental sustainability. If all businesses and organisations could effectively embrace these traits, there would be greater success in effecting social responsibility and environmental sustainability than there would be through the efforts of any governmental campaigns and civic organisations. The ability to factor in social responsibility and to consider environmental sustainability in organisational decisions creates a culture of integrity, compassion, and generosity.

Business excellence requires a relentless focus on customers and on meeting their needs. Customers make up our society, and if organisations are able to meet customer needs and wants, standard of living and quality of life would be enhanced, and society, overall, would benefit. In Singapore, many of our public service organisations (including hospitals and essential services) have embraced the business excellence framework. The result is that people have benefitted from better and more reliable service encounters, with gracious service and shorter wait times. Quality service raises the quality of life in a society, as it makes social interactions more pleasant and pleasing. These outcomes, when consistently produced, will raise standards of living and enhance quality of life in a society – and living a quality life is certainly a primary need of society. The ability to meet this need will definitely contribute to social excellence.

The business excellence framework also requires organisations to have long-term planning and the ability to understand their own strategic strengths and current weaknesses, thus encouraging self-reflection. Self-reflection promotes openness and is a basis for setting expectations that will in turn drive continuous improvements and managerial actions.

The framework requires organisations to continuously upgrade and develop their staff, in order to ensure a good working environment and maintain a satisfied workforce. Again, with organisations adhering to these practices, employees would continuously expand their knowledge and attain the relevant skills to achieve higher productivity and usefulness in society. This reinforces positivity in staff, and if repeated across many organisations,

it will impact on most segments of society and spread positivity in society. Higher productivity in organisations benefits customers in all spectrums of society, which will eventually raise the standard of living in the society and reduce poverty.

In the framework, organisations are required to work in teams to continuously make improvements to its key processes and help the organisations' key suppliers to provide quality supply. Such practices ensure consistency and quality in the organisations' output, helping them maintain a competitive edge and be prosperous. Prosperous organisations ensure employees' livelihood, contributing to economic growth. Job stability and economic growth will positively address societal needs. A culture of continuous improvement breeds curiosity, a desire to engage with others, and higher participation and expectations.

Lastly, the business excellence framework exhorts the collection and use of relevant data and knowledge to make decisions and to drive innovations. This will hopefully spawn innovations that reinforce an organisation's effectiveness and increase the value of the products and services generated. The framework also encourages looking beyond financial results as an indicator of success; instead, success should also be measured in multi-faceted dimensions, which include customers, employee development, and process innovation and efficiency. This encourages organisations to strive for revenue and profits but not at the expense of other important dimensions such as making customers satisfied, developing employees to their fullest potential, and driving innovations and process efficiency improvements. When practised across many organisations and among many industry sectors, such emphasis would raise quality of life and standard of living.

The key attributes of social excellence – curiosity, positivity, openness, connecting and engaging with others, integrity, generosity, participation, compassion, and high expectations – are outcomes that are likely to be found in organisations and their employees that subscribe to the business excellence framework. One can thus see a strong link between business excellence and doing good, and if organisations implement practices dictated by the framework, it will drive social excellence. Organisations that are able to achieve business excellence will play a part in advancing the standard of living and enhancing quality of life through delivering quality products, quality service, improving their employees' well-being, and helping the community through social responsibility and environmental sustainability efforts. Such outcomes reinforce social excellence.

The phrase "business excellence" seems to imply that it is a methodology useful only to "for-profit" organisations, but nothing could be further from the truth. The business excellence framework is a roadmap for any kind of organisation that wishes to put in place programmes and action plans to help it achieve effective performance results and deliver value and quality to its intended customers and stakeholders. Such a roadmap is equally

applicable to not-for-profit organisations, government institutions, and organisations within the civil society sphere. Having our students learn the essentials of the business excellence framework makes them a proponent of such efforts after graduation; and they will be in positions where they can support and drive such efforts throughout their careers, wherever they work.

Bringing in the Real World

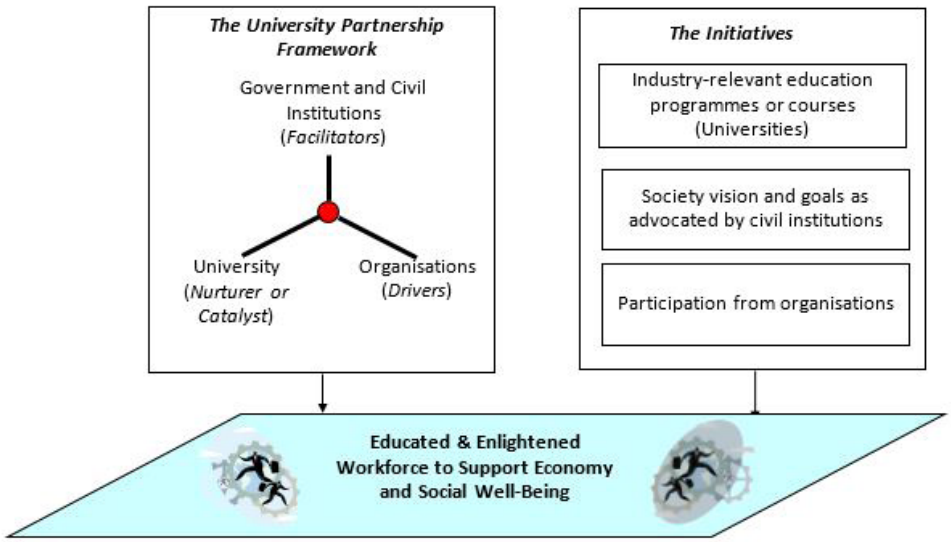
In SUSS' School of Business, we constantly look for ways to "bring the business world to the Business School" and to "bring the Business School to the business world". The *Business Excellence* course is one such endeavour providing industry-relevant learning to students (among others that our University has). It is a course that we partner with SPRING Singapore, the official national custodian of the *Business Excellence Framework,* to introduce its body of knowledge to our students. Conversely, our mainly working-adult student population brings this knowledge back to industry, in organisations where they work in the daytime as advocates for its application.

Offering the *Business Excellence* course brings with it an element of societal education in doing good. Such a collaboration between SUSS and governmental institutions is a distinct feature of our University and serves to support our institution's mission: "*To provide lifelong education, equipping learners to serve society.*" Education is never just a means to improve one's economic well-being; it is about nurturing a learned mind so that collectively, the learned minds of a society can serve the interests of the society and improve the conditions of the less fortunate.

SUSS, as the university for the Social Sciences, will find itself increasingly partnering government and civil institutions, as well as industry, to advance social excellence. The blueprint for such a partnership is as shown in Figure 2. The objective is to nurture an educated and enlightened workforce capable of supporting the diverse needs of our economy and advancing the well-being of our society. The *Business Excellence* course is but one such course among many others that define our university's focus and determination to serve society needs.

The blueprint starts with the partnership framework between industry organisations, government and civil institutions, and the University. The partnership relationship should be one in which the industry organisations are drivers, the government and civil institutions are facilitators, and the University is the nurturer or catalyst.

Figure 2: A Blueprint for University-Industry-Civil Institution Partnership



Concluding Remarks

Our university was first set up to support working adults who wanted a chance to obtain a quality university education without major disruptions to their current social and economic arrangements, which also means staying in the workforce. The University is serving this need successfully. Along the way, we also started to serve the needs of fresh school-leavers who want to opt for an industry-relevant education. Using our strength in providing a flexible learning environment and our rich experience in inculcating independent and lifelong learning in students, we aim to equip our graduates with the industry-relevant knowledge, technical skills, and work skills that will make them enlightened professionals who are assets to industry and also responsible citizens of society.

The *Business Excellence* course is an example of what our university offers to advance social excellence. Other courses and academic programmes in SUSS' schools similarly provide students with an education that helps to advance social excellence. Advancing social excellence cannot be done through an isolated education. Thus, one of the University's hallmarks is its multitude of partnerships with industry and also with government and civil institutions. In years to come, SUSS will expand the intensity and magnitude of such partnerships to support its mission and fulfill its vision – to serve society.

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Chapter 10

Design by Design

Jennifer ANG Mei Sze

Introduction

What is fashionable in today's world of design research is "Design Thinking". In Singapore, the design approach plays a key role in the nation's economic strategy as it envisions itself becoming a global city for design creativity and excellence for Asia by 2020, and a leader in design by 2025. Driven, from 2003, by the Design Singapore Council, and subsequently, by the 2015 Design Masterplan Committee with the Economic Development Board, "Design" in Singapore has been, and continues to be, largely a designed initiative. To realise its 2025 aim of developing an innovation-driven economy and a loveable city, one of its plans is to infuse design as a national skillset by nurturing design sensibilities in the young.[1] As the creative economy takes centre stage, what exactly does a design approach mean? This chapter shows that a design approach brings about innovation but not invention, discusses the shortcomings of design thinking in finding social solutions, and examines whether creativity is something that can be engineered.

1 Design 2025: Singapore by Design, 37.

Design is Innovation, not Invention

Arnulf Grubler in *Technology and Global Change* outlines three distinct phases in the development of technology: invention, innovation, and diffusion.[2] Often, invention is the outcome of systematic research and development conducted by laboratories in universities and corporations. Invention is also at times the outcome of human ingenuity or even a chance discovery by intuitive and creative individuals. But for these ideas to have any real impact on society and the economy, they have to first be translated into practical applications and put into production. And only after it enters into the development stage will innovation take over as the product undergoes experimentation, modification, improvement, and then is made ready for consumption. Innovation involves a complex interaction between generating ideas, getting support and sponsorship for production, and creating a market for the product. Hence, while invention is crucial, ideas that went into the invention stage will only make an impact on society and economy when they are transformed into an application, and innovations only become successful when they can be manufactured and marketed. For instance, we are all familiar with W. H. Hoover vacuum cleaners, without knowing that the vacuum cleaner was invented by J. M. Spengler. Similarly, Singer sewing machines were actually not invented by I. Singer, but Singer copied and successfully marketed the sewing machine, which was invented by E. Howe.

For a technology to be considered successful, it has to be widely accepted, disseminated and reproduced, and it becomes mainstream by supplanting existing products and processes. However, at every stage between invention, innovation, and diffusion, there is a time lag, and so measuring the success of a technology is never straightforward. Some ideas take a long time to translate from invention to innovation to diffusion, while some other ideas enjoy rapid diffusion. An example is nuclear energy. It took all of 15 years, after the feasibility of nuclear energy was demonstrated, for the first commercial nuclear fission reactor to finally be built, and a further 20 years for nuclear energy to form 20% of the U.S. energy source. Diffusion of the Nintendo Famicom video game player, in contrast, was far more rapid. Nintendo sold 50 million consoles in only 7 years after it was launched in the U.S. market.

What these examples show is that if inventions do not reach the development stage where it is applied to some product or process, it will not be translated into commercial products and sold, no matter how good the idea is. And if invention precedes innovation, and innovation becomes successful only when it has widespread diffusion in the society, it is clear that some ideas may not take off at the invention stage, while others may not make it through the innovation stage.

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2 Arnulf Grubler, Technology and Global Change, 2003. 23-4.

A way to shorten the time lags between invention, innovation, and diffusion, and thus to avoid the high rate of failure, is to turn the process on its head: start with understanding what society wants, in order to drive invention and innovation. This means moving design, which was originally in the downstream of the development process, to the forefront. Decide what needs to be created, instead of creating a market for new inventions. Design should go beyond creating an aesthetic value for a product, and instead take the central role of identifying and creating new forms of value in the market.

For Tim Brown, the CEO and president of IDEO, an innovation and design firm, understanding users' needs and preferences is the mark of Thomas Edison's genius. Brown believes that Edison was able to envision how people would want to use what he made; instead of simply seeing the electric light bulb as a discrete device, Edison was able to conceive of a fully developed marketplace.[3] This attention to users' needs and preferences, according to Brown, was an early example of "design thinking": a method that imbues the full spectrum of innovation activities with human-centered design. The design process is described by Brown as "spaces", which all design projects must pass through in a loop – the spaces of inspiration, ideation, and implementation. Designers move between the space of inspiration (triggered by a problem or opportunity), which motivates them to search for solutions or improvements, through ideation (the process of generating, developing and testing solutions), and finally, implementing these solutions in the actual market. Designers move between these spaces as they refine their ideas, explore new directions, iterate aspects of their products, and test them out again. It is like engaging in a dance between convergence and divergence thinking,[4] a constant shift from problem to product, an open-ended and open-minded collective learning experience for every group of designers.

To illustrate design thinking, Brown gives examples of successful innovations to commercial products and services that start with the desire to meet users' needs. For example, the healthcare provider Kaiser Permanente identified how shift changes in hospitals were problematic; Kaiser designed a new procedure and software that improved shift changes for medical practitioners and patients and enhanced efficiency in the passing of patient information. As a result, there is an increase in patient contact time and nurses are able to end their shifts on time. The Bank of America came up with a new savings account service called "Keep the Change" that is built on customers' habit of keeping change and depositing it into their savings account later. With this new debit card account, customers can make purchases and opt to have their change deposited directly into their savings accounts. In examples related to products, Brown explained how Shimano, faced with a flattening growth in the high-end road-racing and mountain-bike market in America,

3 Tim Brown, "Thinking" in Harvard Business Review, June 2008.
4 Tim Brown, Change by Design, 66.

redesigned their production to focus on pleasure coasting bikes, after considering insights from beyond their usual customer base. Aravind Eye Care System in India successfully manufactured cheap lenses for the rural poor, using inexpensive technology. They also extended access to eye treatments for the rural poor by using telemedicine trucks.

These examples show that innovation can redefine the value of a product or service, but its impact and influence cannot be compared to life-changing inventions. The invention of the modern movable type system by Johannes Gutenberg created the printing press; Edward Jenner developed a successful vaccine for smallpox; and Nicolas Appert invented the canning process for food. These are but some examples of inventions that changed our lives completely. Many inventions were applications of scientific breakthroughs made during the scientific revolution, such as the discovery of electricity and penicillin, the theory of gravity and relativity, DNA, and X-rays, etc., that laid the foundation of modern science. The design process, on the other hand, is focused on innovation – the process of experimentation, modification, and improvement on versions of a product and service – and is hence unlikely to discover or create completely new value or bring about great impact. Its merit however, lies in putting people first, and its appeal is that it believes everyone has the capacity to both be creative and create value in their lives.

All Designs start with a Market …

According to Brown, human-centered design recognises that the traditional method of conducting market research through surveys and focus groups does not yield significant insights because people are highly adaptive to their situations and are unaware that they are adapting.[5] Instead, it is through long periods of observing what people actually experience, how they behave, how they adapt to live their daily lives, what they do or do not, and through listening to what they say or do not say, that designers can gain an insight into what their users need.[6] It also requires a connection with users at a fundamental level – the empathy to recognise that users' behaviours represent coping strategies in a less than ideal world. Designers must learn to recognise and solve problems that are no longer obvious to users themselves because they have learned, over time, to cope.

Stanford University's Hasso Plattner Institute of Design (commonly known as the d.school) proposes a five-step approach, with a heavy emphasis on empathy in the discovery stage and obtaining feedback from users at the prototype stage. It recommends that designers observe, engage and immerse in a beginner's mindset by staying curious and questioning everything, by listening and not judging, and by looking out for interesting patterns and

5 Tim Brown, Change by Design, New York: Harper Business Books, 2009, 39.
6 Ibid., 40-3.

themes. It is also crucial to understand users' thoughts, emotions, and motivations by conducting in-depth interviews to identify their emotional and physical needs.

While the success stories of design thinking are mostly product and service-oriented problems from the business world, there are also organisations that apply design thinking to overcome social challenges. Besides the example of Aravind Eye Care System, another company, Hindustan Unilever, has developed PureIt, which is able to deliver 6 litres of purified water for a rupee. Students with the d.school have developed the d.light, which is a low-cost and efficient solution for the poor. We see how the two strengths of design thinking come together: not only are the products and services human-centered, the process itself is also human. However, for the redesigned product to be considered successful, it would still fundamentally need a market. As such, it would seem that companies involved in social innovation projects should first solve an ethical dilemma inherent in seeing the "poor as market".

There are also other shortcomings of design thinking that show that it is not humanist in nature. Its human-centred approach assumes that when it has gathered sufficient majority views, it will be able to identify a similar desire or need within the community. However, in reality, it is not often the case that everyone converges on a similar desire or need. For instance, younger couples who live in a mature residential estate may appreciate the redesigning of an old neighbourhood park so that it incorporates more recreational and fitness facilities, cycling and jogging tracks and playgrounds. Doing so would, arguably, put limited green spaces to better use and contribute to a better standard of life. But, even if many people agree about the so-called upgrade in the name of "improvement", what is forgotten is that people's memories are connected to old places, and reorganising a space also means reorganising people's mode of interaction, habits and attachment. Thus, no matter how "human-centred" the process of a design approach is, it is not informed by a view that every individual is unique. And when human needs are generalised as a community, its outcome will inevitably create loss for some. It also certainly does not tell us how to de-conflict between equally valuable human needs, except to identify what is essential to the design for a viable market.

A further sign that design thinking is not humanist is that it is problem-based. Almost all processes and services can be made more productive and efficient, improved to provide a more meaningful or pleasant experience, and every product can be innovated to be better, stronger, more efficient, more affordable, etc. But *can* doesn't imply *should*. If we start by acknowledging that sieving out real human needs among several and conflicting demands in a community is a challenge itself, and that prioritising these needs while working within cultural, religious, environmental and financial constraints is already no easy feat even for

a government, it is clear that we should not start off by assuming that there is always a problem that needs solving, or a process or product that needs improving. It smacks of a neo-colonialist mentality with the use of soft power, and countries and communities should question the motives of those who profess they have a "Doing well by doing good" type of business philosophy.

Lastly, in seeing opportunities for innovation everywhere, the designer's approach converges on a single "problem" to gain insights before thinking divergently for solutions. But at which point does the designer consider the place of his design in a society and the way his design would affect other people? Certain roles and jobs, relationships and behaviours are built over time as we adapt to our situations and environment, and an introduction of a new way of doing things, or a new product at a lower cost will impact people's lives, but not always for the better. Design thinking is more interested in generating new ideas than understanding how they might work, especially in how it might affect the cultural context and people's lives and livelihood. As such, designers often miss out the big picture – where design is considered as part of a larger system with complex relationships with other stakeholders and processes and a clear view of its effects on other stakeholders. This then limits how humanist their design can be. In fact, the designing process itself does not involve those who are affected by the designs, but is usually led by a group of professional designers.

Design by Design: What Else is Needed?

What is clear thus far is that for design thinking to be truly human-centred, designers need to be guided by other forms of thinking. Design thinking alone is unable to help us make decisions between conflicting values that are not based on market value – that requires ethical reasoning. It is also inadequate for evaluating options – that requires logical analytical thinking. And finally, it is unable to identify root causes that drive change in a system or see its effects and impacts on others in the system – that requires system thinking. In short, *thinking should take priority, not design.*

Singapore's "Design by design" national strategy appears to have achieved this balance. Having considered the interrelated and complex relationships between different stakeholders in both private and public sectors, Singapore views design as the key to drive a much-needed paradigm shift from an industrial economy to a knowledge-based economy. It aims to do so by harnessing the design sector as a new growth area to improve capability, national competitiveness, creation of new jobs, and improve the quality of life – all aspects that could contribute to nation building.

In its first phase, the DesignSingapore Council (Dsg) sought out key areas, project models and tools that were needed to develop a sustainable design sector in Singapore. Its plans were guided by three ideas: 1. that Design is a culture, with both an economic and social agenda; 2. that Design is in the knowledge and creative economy, valued in IP (intellectual property) terms and pursued through creativity and research; and 3. that Design is within an inter-disciplinary eco-system and part of the Creative Industries with the arts, media, technology and business.[7]

In 2005, Singapore had climbed from 22nd in 2002 to 16th position in the 2005 Design Competitiveness report and was singled out, together with Denmark, as the "real winners".[8] The next thrust of the plan was to build on its achievements by: 1) strengthening the design cluster; 2) embedding design industry clusters to enlarge the impact of design economically, socially and environmentally; and 3) accelerating the transformation of the design and economic clusters by leveraging design innovation to capitalise on the first-mover advantage.[9] Design innovation is now seen as a "vibrant integrated and competitive" cluster and an "enabler to enhance the performance of other economic clusters and the society as a whole".[10]

In 2015, Singapore was designated as a UNESCO Creative City of Design that sees itself as working towards becoming a leader with an innovation-driven economy in a loveable city. The Design 2025 plan sets out the role of design in driving innovation and value creation, solving complex societal problems, and contributing to national identity and branding.[11] To do so, the government plans to infuse design into everyone's skillset to transform the way Singaporeans live, learn, work and play – contributing to Singapore's national initiatives such as Smart Nation, SkillsFuture and Future Economy. While innovation and technology can raise productivity, will developing design as a culture and a national skillset help solve complex societal problems and build national identity? Should it?

Certain social needs may be fulfilled in the interim by redesigning the provision of social services and the use of technology. But finding root causes to complex societal problems requires imaginative ways of asking questions. Developing ways to dissolve social issues or finding solutions that can drive social change will require deep thinking to re-conceptualise the issues and produce creative long-term solutions. In the same way, putting Singapore's design sector on the global map for a successful national branding can

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7 Strategic Blueprint of the DesignSingapore Initiative, 27.

8 Design Competitiveness Report is drawn from the data from the World Economic Forum. "Global Design Watch: April 2006" by DESIGNIUM, the New Center of Innovation in Design at the University of Art and Design, Helsinki. Finland, United States, Sweden, Denmark, Taiwan ranks above Singapore.

9 Strategic Blueprint of the DesignSingapore Initiative, 66.

10 Strategic Blueprint of the DesignSingapore Initiative, 66.

11 Design 2025: Singapore by Design, 15.

be achieved by dedicating national effort and resources to developing and promoting Singapore's design sector, but *Singapore's national identity is not something that can be engineered and constructed.* This is because our heritage is to be preserved rather than engineered as a matter of national policy; our arts and culture are organic and capture the imagination of ordinary Singaporeans – they are not a construct that can be defined by the State.

In fact, many of the new designs work against the building of national identities. The well-loved National Library on Stamford Road was demolished to make way for a tunnel to ease the projected high human and vehicular traffic after the government decided to build a university in the city. Although the new National Library at Bras Basah has won many awards for its environmental friendliness, what is remembered is the loss of the original library building. The deep attachment and the collective memories of generations of Singaporeans, the emotional outpouring of affection for the red-brick building – all went unheeded. Another recent reminder of how little the voices of the civic society mattered to urban planning is the excavation work at the Bidadari cemetery in Upper Aljunied Road and the Bukit Brown cemetery along Lornie Road. Other living spaces, such as the 17 blocks of flats in Dakota Crescent remembered for their architectural, historical and social significance as one of Singapore's oldest public housing estates, have also made way for residential redevelopment plans despite calls by the public for their conservation. The National Stadium, which held events that contributed significantly to the collected memories of the "people" – the nation's first National Day Parade, football matches, SEA games, Interschool National games, etc. – was also traded in for something bigger and better. These examples of "physical markers" of familiarity, common history and common experience on which our sense of belonging is built and by which we remember who we are as a "people" – these are replaced by plans designed with no community involvement.

Furthermore, since the 1980s, cultivating "design" as a culture is essentially a continuation of cultural policies. The Singapore government recognises the value of creative events and products, arts, culture and heritage for their economic potential in promoting tourism and boosting jobs in the creative industries of mass media and digital technology. Arts and culture also have a social role in promoting cultural diplomacy and guarding against western art and cultural products. Having a vibrant arts scene was also essential in the 2000s because it was (and still is) regarded as an attribute of a cosmopolitan city in its vision to be the Boston of the East. Singapore needed to fashion itself this way in order to retain foreign talent and boost entrepreneurship. Today, Arts is replaced with "design" to be promoted as part of the creative economy for national branding rather than to be valued as "Arts", "culture", or the process of creativity for its own sake.

To truly embrace creativity in order to create actual new value, we need to nurture creativity

and recognise that creativity as a culture needs a broader socio-cultural environment in which to grow; this is more than just a cultivation of activity and design sensibilities such as those outlined in the Design 2025 plan. The plan has 5 thrusts, one of which is the cultivation of activity and design sensibilities in preschoolers until they are in secondary school, through the use of an integrated curriculum and enrichment programmes. The Design 2025 plan also seeks to develop multi-disciplinary and industry-ready designers, giving recognition to promising talents at tertiary school levels, and introducing continual professional development and accreditation programmes for those in practice. But creativity is not a skill to be taught, imagination needs inspiration, and originality only thrives in a culture that celebrates individuality.

Concluding Remarks

The design approach is not new, and its fancier version today has too many blind spots if what we aim for is creating actual value for people by people. The focus on the "human" is stuck at the level of "need-finding", but its findings are filtered through the designers' lenses, while its ideation process is designer-driven. The level of creativity in design thinking often remains at the level of brainstorming for ideas to produce solutions that are indeed innovative, but always with an eye for wider market viability.

In the same way, and at a fundamental level, Design 2025 also misses the point. When we treat creativity as a means towards economic ends, we find ourselves at the level of improvisation, adaptation, and innovation – making improvements to services and products around us because we are motivated by a market need we can identify. Our solutions also tend to be technological in nature: a modest optimisation of a similar technological solution found in other applications. What we will not get is inventions – because we will not have original and imaginative perspectives, the ability to develop creative and inventive solutions, or to even conceive of inspiring visions of tomorrow. We will also not be able to achieve truly "human-centered" solutions that are driven by and capture the imagination of ordinary Singaporeans.

Perhaps the tagline of Design 2025 – "Singapore by Design" – already reveals its real intention: creativity is celebrated if it follows economic imperatives. What we need now is a reorientation of our pragmatic approach. We need to appreciate the intrinsic value of our collective memories and cultural infrastructure before we redesign who we are as a "people", and realise the intrinsic value of creativity before we redesign our education system and socio-cultural policies. Isn't it time to celebrate the value and agency of Singaporeans, individually or collectively, and believe in their ability to improve their lives through their ingenuity?

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Chapter 11

Cities of the Future: Singapore Public Transport 2030

PARK Byung Joon

Introduction

There was much public dissatisfaction over the performance of public transport in Singapore, notably after the train disruptions in December 2011. The government announced the adoption of a new bus contracting model in 2014 and completed the transition to the new model in September 2016. Under the new bus contracting model, the government will own all operating and capital assets (such as buses and bus depot facilities). The operation of bus services will be contracted to commercial bus operators via tender exercises. The key purpose of adopting the new bus contracting model is to provide a public bus system of a higher level service than can be afforded through fare revenue alone.

Similarly, ownership of SMRT's operating assets on mass transit railways was transferred to the Land Transport Authority (LTA) under the new rail financing framework in July 2016. Under this framework, the bulk of the investment needed to replace and upgrade railway assets will come from the government budget. Independently, the Public Transport Council (PTC) is reviewing the fare formula with a target to complete its review by the first quarter of 2018 (Lim 2017).

All these developments make us wonder what Singapore public transport will look like in future. In this chapter, I will share in two parts my opinion on what Singapore's public transport will look like in 2030. First, I will provide my predictions about the modes of transport in 2030; and second, I will discuss how public transport should be managed and funded in the future.

Modes of Transport in 2030

Autonomous Vehicles

It seems that there is genuine enthusiasm for autonomous vehicles at Singapore's Ministry of Transport and the LTA. Tan and Tham (2014), who both worked for the future mobility division at LTA, discussed the potential applications and benefits of autonomous vehicles for a land-scarce city like Singapore. To begin our discussion here, let us first distinguish "autonomous vehicles" from "driverless vehicles".

"Driverless vehicles" refers to any kind of automation in the driving function. Such vehicles can rely on external aids or guidance to navigate routes. For example, the ULTra (Urban Light Transit) pod deployed at Heathrow Airport in London is a driverless vehicle system that runs on specially built tracks. Another example, the 2getthere, an automated vehicle by a Dutch company tied with SMRT, is driverless; it navigates by following guided pins placed 200 metres apart in the ground.

These two systems have more flexibility than driverless-train systems, as they are able to create a variety of routes by combining different pick-up and drop-off points. However, these vehicles cannot navigate on their own without their external guides. In contrast, autonomous vehicles must be able to find the way and drive on their own to specified destinations. The only external inputs autonomous vehicles receive are Global Positioning System (GPS) signals.

There are two main reasons why autonomous vehicles will not be used as the main modes of transportation by 2030. The first reason is the daunting prospect of technological development. The second reason is the economics of deployment and the related question of ownership costs.

In January 2016, the National Highway Traffic Safety Administration of the US adopted the Society of Automotive Engineers' (SAE) levels for automated driving systems, ranging from complete driver control to full autonomy (Reese 2016). It ranges from level 0 (no automation at all) to level 5 (fully automated vehicles).

Ford Motor Company expects the general public to be able to buy fully autonomous vehicles sometime between 2026 and 2031. There is even a good chance that level 5 vehicles may be introduced to the market by 2030 (Martinez 2017). However, it does not mean that the development of a level 5 vehicle would have been completed by 2030. Ultimately, fully autonomous vehicles must be able to react to hand signals from traffic police. This technologically challenging requirement will not be attained by 2030, which means that there is still some way to go for fully autonomous vehicles. Some level 5 autonomous

vehicles may be ready for feasibility-testing as a first- and last-mile solution for the elderly and the disabled even before 2030. However, it would still be in the testing stage.

It will take a long time for the industry to sufficiently increase production volume to bring down the cost for autonomous vehicles. Bearing in mind that about 17 million cars were sold in the US alone in 2016, the required similar industry base of production lines and supplier networks for autonomous vehicles would take many more years to establish. Until then, the cost of acquiring and deploying autonomous vehicles will be much higher than deploying conventional cars driven by human drivers.

Personal Mobility Devices (PMDs) and Bicycles

Less than two years ago, the Ministry of Transport was lukewarm about promoting bicycles as an alternative mode of transport for commuters. The car-lite push now, however, has the ministry looking into other means of transport for commuters to get to the bus or train (Cheong 2017). Currently, 1.5% of all trips are done by bicycles, and LTA hopes that the number of people using bicycles or PMDs will reach 4% to 6% of all trips in five to ten years. In Taipei, for example, cycling already takes up 6% of all commuter trips.

LTA has set a goal that "5% of people will use bicycles or PMDs for their trips" but even if LTA achieves this goal, 95% of us will still not be using bicycles and PMDs. And there is a good reason why the figure should not be any higher than that. People on bicycles or PMDs need more road space than people on buses.

If a majority of commuters use bicycles or PMDs for their trips, Singapore's pedestrian paths will be jam-packed with people on wheels. It is not hard to imagine the chaotic scene in which thousands of people are coming to a train station and trying to find parking spaces for their bikes every morning. For a fraction of commuters, therefore, say up to 5%, cycling and PMDs can be an option. It should not be an option for the masses.

Dynamic Routing Shuttle Bus

One more emerging technology is worthy of mention here. In every city, there is a great gap between taxis and other modes of public transport in terms of fare and total travel time. In many cities, shuttle buses provide something in between. For example, compared to paying HK$300 to 400 to take a taxi to go to your hotel from Hong Kong International Airport, taking a shuttle bus at the fare of HK$150 is an attractive alternative, even if your hotel happens to be the last one on the route. Dynamic Routing is similar to the technology used by Uber Pool. As Brustein (2014) described it, "routes are formed and reformed as the vans pick up riders along the way." Finding one more rider who happens to be heading in the same direction for Uber is one thing, but doing similarly for 10 to 15

people all over the island is quite another. It remains to be seen whether shuttle buses on dynamic routing will become an important mode of transport by 2030. I have my doubts.

How then will most of us travel around Singapore in 2030? It may sound like a boring prediction, but most of us will continue to walk to bus stops, catch buses to train stations, and ride the trains.

Mass Rapid Transit

The total length of Singapore's mass rapid transit (MRT) rail network will be doubled by 2030, and 8 out of 10 households will be within a 10-minute walk from a train station. The six-car trains currently serving the East-West line can carry almost 2,000 passengers. In addition to the expansion of the rail network, the railway signalling system is being upgraded from "fixed block" to "moving block" signalling. With the new signalling system, trains can run in much shorter intervals apart, e.g., 1 minute. This means the East-West line would be able to carry 2,000 commuters every minute. No other mode of transport can match the massive passenger-carrying capacity of the rail network.

As such, in cities with comprehensive railway networks, such as Seoul, Tokyo and London, public transport is built around the mass transit rail networks. The mass transit railway is the backbone of public transport, and other modes such as bus services complement the rail network. With the expanded rail networks equipped with the new signalling system, Singapore will join these cities by 2030.

Public Bus

I am one of the many urbanists who believe that the bus remains a key to city transit in the future. On given road networks, buses are the most cost-effective way of providing transport for a large number of commuters. Buses also provide great flexibility for city planners to create and adjust service routes.

To remain as a key form of Singapore city transit in 2030, however, some reforms are needed in bus service planning. Since the implementation of the Bus Service Enhancement Programme (BSEP) in 2012, the focus of improving bus services has been on capacity (i.e., the number of buses in service) and connectivity (creating new routes or extending existing routes). Those were probably the correct areas of focus in the context of the 2010's. However, when construction for new railway networks is completed by 2030, what will really be needed is the total redesign of bus service routes to focus on total travel time.

Currently, commuters are served by two types of bus routes: trunk buses and feeder buses. Trunk buses ply between towns, while feeder buses operate within a neighbourhood. They

transfer commuters from MRT stations and bus interchanges to surrounding housing estates and industrial areas (see MyTransport.sg 2016). Other types of services, such as city direct buses or express buses, only provide complementary options for commuters during peak periods.

With railway networks having relatively sparse coverage, trunk buses have played a critical role in providing connectivity to various corners of the island. For Singapore's bus services, however, the connectivity has been achieved at a certain cost; most trunk buses have routes that twist and veer around the towns. They also tend to have service routes that cover long distances; it is quite common for trunk service buses in Singapore to have service routes longer than 30 km. Inevitably, it lengthens the total travel time for commuters.

There is a commonly observed pattern in public transport surveys all over the world. Commuters who already use public transport value service frequency and punctuality the most. However, commuters who do not use public transport are most concerned with the total travel time. If connectivity is measured by the distance that commuters have to travel to get to the public transport network, Singapore scores very well. In fact, every household is supposed to be within 400 metres from a bus stop. However, if connectivity is measured by the total travel time (or the difference in travel time between driving directly as opposed to using public transport) between any two location points, some commuters, particularly those who do not live near MRT stations, will find that they lose out.

To achieve the Ministry of Transport's target that "75% of journeys [are] made on public transport during peak period" in 2030 – up from 63% in 2014 (Ministry of Transport 2014), connectivity should be measured by total travel times rather than the distance to the public transport network, and the improvement of public transport should focus on reducing total travel time. With far more comprehensive railway networks by 2030, the days that Singapore commuters are served by trunk buses with routes weaving around towns should end. The routes for trunk buses should be adjusted to provide more direct connection between towns, thus offering service routes that complement the railway network.

Walking

Even today, the distance that commuters have to walk to the nearest bus stop is not too far. If a feeder bus network provides "quality" connectivity in terms of total travel time, people will be willing to walk that distance. With the growing network of sheltered walk paths, coupled with the trend of encouraging fitness in life, most commuters will solve their "last-mile" problem by walking.

Car Club

The key aspect of a car-lite society is to reduce car ownership. It does not mean that total traffic volume will go down. A significant portion of trips will still use private transport. However, more people will drive cars that they do not own or lease.

Car clubs are effectively car rental services. The difference with normal rental car services is that with car clubs, people can rent cars for very short periods of time. The idea of car clubs is not new. The vast majority of privately-owned vehicles just sit in parking lots for more than 90% of their service life. It makes perfect economic and social sense to share vehicles with other users. This way, more people will be served with fewer vehicles.

There have been various attempts in Singapore to start car clubs, but there has not been any meaningful success yet. However, in many other parts of the world, the car club is starting to show its potential as a commercially viable business. Two main factors contribute to car clubs' lack of success in Singapore. First, despite the government's effort to promote a car-lite society, young Singaporeans still show a strong desire to own cars (Tan 2016). Secondly, car sharing businesses require heavy upfront capital investment. Due to limited funding, most car clubs in Singapore start with a very small fleet and thus are not able to provide readily-available access to their cars.

The Certificate of Entitlement (COE) system that effectively puts a cap on the total number of cars in the country, however, makes Singapore a perfect place for car clubs to prosper. There will not be enough registered vehicles to go around for everybody. Registered vehicles should thus be seen as public goods to be shared with others. In South Korea, SOCAR started its car sharing business in 2012 with 100 cars for 300 members on Jeju Island. In April 2017, its business grew to 6,500 cars for 2.1 million members, with 2,450 pick-up/drop-off points. Now, Mercedes has a car sharing subsidiary, Car2Go; GM started Maven in 2016; and DriveNow is BMW's car sharing service. We will see the growth of car clubs in Singapore by 2030 and beyond.

Governing of Public Transport in 2030

Since its inception, the paradigm for public transport policy in Singapore has been: "The government builds the infrastructure for transport, and the commuters pay for operating expenses via fares." The government has recognised that public transport is a vital part of social infrastructure for the nation's economy and social cohesion, as it links people with their work places, schools and medical care facilities. As such, the government has not put on commuters the burden of recovering the capital investment to build railways, bus

depots and other support facilities. Fares have been set at levels only to recover the transport operating expenses.

At the same time, the Singapore government has shown a strong reluctance towards providing further subsidies for operating expenses. To prevent public transport from becoming a budgetary strain, the operating expenses of public transport must be fully recovered from fare revenue. This paradigm worked very well until 2011.

However, with new policy refinements for buses and railways, in which the government takes fuller ownership of the transport assets, the current fare adjustment formula, focusing on the recovery of operating expenses for public transport operators, is no longer relevant to public transport in Singapore. The formula is only good if the total capacity and the network of public transport have not changed. As such, the Public Transport Council (PTC) will be proposing a new fare adjustment formula and mechanism by the first quarter of 2018, and the consultation with the public and academics has already commenced.

New Fare Adjustment Formula

Since there is no doubt that the service standard set by LTA on public transport is going to be higher than the level of service that can be delivered by fare revenue alone, PTC is effectively making a policy decision on how much expenditure on public transport will be funded by commuters and how much will be funded by tax payers (through subsidy) via fare adjustment exercises. The total expenditure for public transport comprises three main components: 1) operating expenses, such as fuel costs, bus drivers' wages, and operating assets' maintenance costs; 2) capital expenditure for asset replacement, when train rolling stocks or buses reach the end of their service life; and 3) capital expenditure for capacity expansion and technology improvement, such as constructing new railway lines and upgrading the rail signalling system.

First, PTC must decide which components of expenditure should be recovered from fare revenue. I recommend including only operating expenses and capital asset replacement expenditures. The government recognises that public transport has a crucial role for national economy and social cohesion. Capacity expansion and upgrading should be seen as a duty of government, to be provided as economic infrastructure funded by taxes. On the other hand, commuters – the sole beneficiaries of improved public transport – must bear some burden of capital expenditure. At least part of the capital expenditure for asset replacement should be recovered from fare revenue.

Secondly, PTC must establish the principle for the percentage of expenditure that should

be recovered from fare revenue. If we are more concerned about the affordability of public transport, particularly for the working-class family, then tax payers should pick up a larger share of the expenditure. On the other hand, if we are more concerned about the long-term financial sustainability of public transport, fare revenue should be able to pay for most of the expenditure.

Subsequently, fares will be adjusted annually according to the amount of expected expenditure to be recovered that year. Capital expenditure for asset replacement may vary greatly from year to year. If a large number of assets are due for replacement in a certain year, capital expenditure for the year will be very high. It may not be desirable to let fares fluctuate greatly in tandem with capital expenses.

One of the most important debates for the new fare adjustment formula is whether the improved service level in public transport should be factored into the fare. Good public transport does not come cheap. Instead of adjusting fares according to the total expenditure, one may prefer to adjust fares according to the level of service provided. The Service Level Index can be developed to reflect the capacity of the system (e.g., the number of buses in service), coverage of network (e.g., distance to the nearest MRT station), on-time performance, number of breakdowns (estimated from the previous year's performance), etc. However, it can be overly complex (and arbitrary) to develop such a service level index.

The current fare adjustment formula has a productivity extraction component. The productivity extraction component compels public transport operators to improve their operational efficiencies. The component was set at 0.5% for 2013 to 2017. That is, if the price index merits, say, 3% upward fare adjustment, the formula will only allow up to 2.5% of fare adjustment. The public transport operators must make up the difference by improving their own productivity.

Under the revised paradigm of public transport, however, the fare adjustment formula cannot be a motivator for public transport operators to improve their productivity. A certain set of service performance standards should be imposed on train operators. If they meet the performance standards, they should be able to earn more on top of their earnings before interest and tax (EBIT). If they fail to meet the performance standards, they should lose from the EBIT.

In the new fare adjustment formula, the formula should not be used as a motivator for innovation or improvement. A separate set of incentive/disincentive schemes should be imposed on public transport operators.

Governance of Public Transport

Currently, two main bodies govern Singapore's public transport: 1) the Land Transport Authority (LTA) takes the role of regulator, and 2) the Public Transport Council (PTC) advises the government on public transport matters. One of LTA's main roles is to set service standards for public transport operators. On the other hand, fare adjustment is under the purview of PTC.

The separation of service standards setting and fare adjusting roles may not be the best way forward. The exercise of setting service standards effectively determines the amount of money needed to run public transport services. To strike a proper balance between providing a high level of service and keeping the resources required to run the public transport service within affordable levels, there should be one body that looks into both service standards setting and how it should be funded in a more coordinated manner.

Conclusion

Some fundamental changes in the paradigm of public transport have already taken place in Singapore in recent years. Encouraging commuters to use more public transport is part of the Singapore government's effort to create a liveable city through car-lite urban mobility (Centre for Liveable Cities, and Urban Land Institute 2017). Several initiatives towards a car-lite society have already been taken. The plan to expand the network of covered walkways has been approved by the government. The 46 km of covered walkways (as of 2014) will be increased to 200 km by 2018.

Cycling is now officially encouraged as an alternative mode of commuting. In January 2017, the Active Mobility bill was read for the second time in Parliament to legalise the usage of personal mobility devices such as electric scooters on public roads. The Urban Redevelopment Authority (URA) expanded car-free zones for the Car-Free Sunday SG programme as part of the larger movement towards a car-lite Singapore. These, coupled with a good public transport policy – including an equitable fare structure – can only be a good thing for the future of the Singaporean commuter.

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Chapter 12

Humans Still Matter in Productivity, Safety, and Technology

CHUI Yoon Ping and TAN Teng Hooi

Introduction

In 1961, Singapore's Gross Domestic Product was 704 million USD and the rate of unemployment was 10%.[1] In 2016, Singapore's GDP was 304 billion USD and the unemployment rate had dropped to less than 2%. Productivity is central to the growth and prosperity of Singapore. With virtually no natural resources, Singapore's chance of success hinges on the quality and quantity of the products and services the young nation offers; it also matters how effectively and efficiently these products and services are offered. In the early years, the emphasis was on equipping workers with relevant skills, and that has brought remarkable success in creating employment and meeting market demands. As the nation developed further, the economic growth rate became less impressive. More crucially, the productivity growth slowed; while the economy rose some 8.2% from 2004 to 2007, productivity growth slowed down to 0.8% per year from 1999 to 2009. This is due to heavier reliance on labour, especially foreign manpower.

In 2010, a sector-based strategy was developed in Singapore to improve national productivity by 2 to 3% per annum over the following 10 years. The impact is significant, as the 16 priority sectors identified contribute about 55% of Singapore's Gross Domestic Product (GDP) and 60% of employment.[2] Funds have also been created to provide incentives for workforce development and skills upgrading, technology adoption, and capability building. The move is to reduce over-reliance on foreign workers. Singapore businesses, in short, are now faced with the challenge of having to "do more with less".

1 Auyong 2016.
2 Singapore Productivity Association 2014.

Productivity at What Cost?

In their zeal to raise productivity while downsizing, many companies have been known to push their workers to multi-task, work harder, and work longer hours. However, there comes a point where there are diminishing returns. For example, overworked workers eventually get fatigued; this results in impaired judgement, which causes errors; inefficiencies soon set in, which then impact productivity. An unhealthy work environment also results in sickness and injuries, which in turn lead to absenteeism and low morale. Absenteeism directly reduces productivity; even if a replacement can be found, the output is usually reduced.

While the effect of absenteeism on productivity is obvious, employers have also become interested in presenteeism – employees who are present at work but are limited in their job performance due to physical and mental problems. The *Harvard Business Review* estimated that loss of productivity due to presenteeism is on average 7.5 times greater than the losses due to absenteeism, and three times the expenses incurred for direct medical costs.[3]

Cost of Accidents and Benefits of Prevention

The International Labour Organisation (ILO) states that globally, about 2.3 million people die every year from occupational accidents and diseases. Some 270 million people suffer serious non-fatal injuries, and another 160 million fall ill from work-related causes.[4] These cases impose a huge cost on national economies. There are tangible and intangible costs to workers, their families, the businesses that employ them, and society at large. These are in terms of healthcare cost and degradation in the quality of life, compensation and litigation cost, and especially the cost caused by loss of productivity. In established market economies, the total costs of such accidents and ill health amount to approximately 4% of the GDP. If these accidents at work and work-related ill-health can be prevented, the potential benefit to businesses and the country is substantial.

A study by ILO in 2006[5] found that countries with the best records for accident prevention at work are the most competitive; unsurprisingly, countries with poor working conditions put a heavy burden on the economy and hinder their own economic growth. For example, workers in Finland, the USA, and Singapore have the lowest fatal accident rates; these countries are also amongst the highest in terms of competitiveness. Evidence from case

3 Hemp 2004.
4 ILO, Safety and Health at Work.
5 ILO 2006.

studies in the UK show that occupational safety and health programmes result in financial benefits.[6] More important than just making good business sense, the protection of human life is a matter of human rights and should never be compromised.

Link between Productivity and Safety

Healthy workers working in healthy working conditions are thus an important precondition for any enterprise to run smoothly and productively. While it appears at first glance that productivity can be attained without regard for workers' health and safety, there is good research showing that health and safety measures have a positive impact not only on safety and health performance but also on a company's productivity, which in turn increases business profits. Thus, a highly developed occupational safety and health (OSH) management system increases the safety performance, as well as the competitiveness and economic-financial performance.[7]

The safety performance can be related to outcomes such as reduction in injuries, material damage, and absenteeism. Competitiveness can be linked to elements such as improvement in product and service quality, customer satisfaction, and corporate reputation and image. In addition, the more advanced the OSH management system, the more satisfied these organizations are with their economic and financial indicators. OSH interventions or measures bring about positive individual and organisational outcomes that eventually contribute to company performance. OSH should, therefore, not be seen as purely a cost, but also as an investment to improve the overall performance of a company. OSH should be an integral component of general management.[8]

Safety and productivity complement each other and should always be considered together. To improve safety and productivity, everyone in the organization, from management to workers, must have a safety mindset and exhibit safe behaviours. That includes being mindful of their moral responsibility to ensure the safety and health of fellow workers who may be injured in the course of work.

Total Workplace Health and Safety

Singapore, being heavily dependent on productive workers for its economy, needs to consider ways to ensure that manpower resources are not only safe but also healthy.

6 PricewaterhouseCoopers 2008.
7 Hesapro Partners 2013.
8 De Greef 2004.

Challenged with an increasingly ageing workforce and a tight labour market, Singapore's workplace and processes need to protect and promote the health, safety, and wellbeing of all workers, and ensure the sustainability of the workplace.

In 2016, Singapore launched Total Workplace Safety and Health (Total WSH); this is a holistic and integrated approach to managing safety, health and wellbeing in the workplace. It recognises that risks at the workplace can affect the health of the workers; likewise, the health of the workers will in turn alter the risks of the workplace. A holistic risk management includes looking at all aspects of work that can have an impact on both the health and safety of the workers. Part of the risk assessment is to identify ergonomics risks at the workplace and assess "human factors" as potential contributory causes for workplace accidents.[9]

What is Ergonomics or Human Factors?

Human Factors (HF), or Ergonomics, is the scientific study of human capabilities and limitations, characteristics, behaviour, and motivation; and the application of this knowledge to the design of tasks and processes, equipment and systems, workplace, and environment in order to ensure safety and maximise efficiency and productivity and even to derive satisfaction.[10] The term ergonomics is more widely used in the UK and Europe, whereas the term human factors is usually employed in the US. In this chapter, the terms are used interchangeably.

Human Factors puts people at the centre of design considerations so that jobs are fitted for the workers; workstations should be able to accommodate the worker, technology should be easy to use and understand, and the environment in which a worker operates should be safe. The objectives have always been to enhance effectiveness and efficiency. Human Factors eliminates extra steps in a task, minimizes the weight of a load that must be carried, designs simpler steps to follow, creates displays that are easier to view, constructs systems that are intuitive to use, and so on.

The application of HF principles extends beyond the occupational setting to everyday life: for example, how we interact with consumer products, or how we react to services provided in a hospital. The underlying philosophy, approach, objectives and focus of Human Factors is to make life better for people.

9 WSH Council Singapore 2014.
10 McCauley-Bush 2012.

But is Human Factors Worth the Bother?

Is Human Factors worth investing in? The Workplace Safety and Health Council of Singapore announced that "stiff necks from bad posture at work, strained backs from lifting boxes and numb wrists from too much typing – these and other ergonomic health issues cost Singapore a whopping $3.5 billion a year".[11] To tackle this, the WSH Council launched guidelines on improving ergonomics in the workplace at an Ergonomics Forum held at SIM University or UniSIM (now known as Singapore University of Social Sciences or SUSS). The then Senior Parliamentary Secretary for Manpower, Mr Hawazi Daipi, also announced that back injuries due to ergonomic risks – such as carrying heavy loads – will be classified under "work-related musculoskeletal disorders" in the annual WSH statistics. Previously, they were just classified as minor injuries. The WSH council has since provided information, resources, and advice on how organizations and individuals can prevent or minimize work-related musculoskeletal disorders (MSDs) in the workplace by applying the principles of ergonomics to the work environment, equipment, tasks, and jobs.

This involves ensuring that tasks do not require twisting or excessive force; items that are frequently used should be within easy reach; work postures are kept neutral as much as possible and are not constrained; pressure points are eliminated; workers are encouraged to move about and to perform simple stretching exercises; and they are given sufficient rest. It is important that a holistic approach is taken, as the most expensive and fancy ergonomics chair will not help if the worker is required to sit in the chair for hours without rest breaks.

Given the relatively short history of ergonomics in Singapore, having the government place emphasis on ergonomics at the workplace is a real breakthrough, and it has resulted in much rejoicing within the local Human Factors community. Unfortunately, ergonomics/human factors in Singapore is often seen as being synonymous merely with physical workstation design. Sadly, ergonomists are too often seen simply as designers of tables and chairs. There is much more to Human Factors than designing tables and chairs.

Human Cognition and Ergonomics

Cognitive ergonomics is about understanding people's cognitive capabilities and limitations and designing systems that are compatible with human cognition. This is an

11 Heng 2014.

important consideration, given that most accidents are due to someone forgetting to do something. Or someone thought it was supposed to be done in a certain way. Perhaps someone was distracted and missed a step or simply made the wrong decision because of lack of understanding. Sometimes these missteps merely result in minor irritation, such as putting salt instead of sugar in the coffee. But often, the result can be disastrous: a quick glance away from the road to look at an incoming message on the phone, for instance, could result in a fatal accident.

Certain types of work are cognitively more demanding than others. For example, air traffic controllers have to stay vigilant at all times, and fighter pilots are required to maintain good situation awareness (SA) to win a dogfight. Even so called unmanned flight is manned by a team of operators who have to maintain not only individual SA but also team SA. Teamwork imposes additional cognitive demands, as members are required to be cognizant of their own performance as well as that of the team members. Most people are unaware that team-tasks – leading, coordinating, communicating, monitoring – impose an overhead in terms of mental and physical workload. Cognitive task analysis is usually employed to first study how mentally taxing a particular task is, and then to consider how the system can be better designed to support the operator.

Cognitive ergonomics is also extremely important in designing complex systems. Poorly designed automated industrial equipment, for instance, can lead to unscheduled breakdowns, affecting production and quality.

Ease of Use and the Need for Pleasure

Over the years, human factors professionals who specialize in human-computer interaction (HCI) design have been striving to make computers easier to use. We have come a long way from the days of MS-DOS, and we no longer need to memorize complex and meaningless syntax. Direct manipulation interfaces now allow users to simply click on an icon to learn more about it, and the ability to undo actions is invaluable. HCI experts have developed guidelines for better user interface design through years of research and knowledge in human cognition. Apple, currently the most profitable technology company in the world, has developed a whole brand based on the "ease-of-use" mantra. Indeed, the launch of the first iPhone revolutionized the way we interact with technology. With the introduction of touch screens and gesture-based interfaces that we take for granted today, young and old are now able to access a world of personal and social computing that our computer industry forefathers would not have imagined.

Now that ease of use has become a given, the focus of HCI has moved – from functionality to usability and now, to user experience. It is no longer enough to create usable products;

now, products must bring pleasure and a positive experience. Affective computing and pleasurable design, creating needs and uses that never existed – these now challenge designers, developers, and programmers. Now, for instance, recording your current meal and instantly sharing it with the world has become a need, or you can beautify your selfie and turn it into an anime.

The Big Picture – Organisation Ergonomics

Major disasters result in huge loss of human life and environmental destruction. Accidents are usually caused by complex and interacting factors involving socio-technical systems and organisational factors. There is therefore a need for organisation ergonomics.

Organisation ergonomics is concerned with organisational structures, policies, processes, quality management, and work paradigms, and the optimisation of socio-technical systems. Increasingly, the importance of studying the impact of organisational factors on workers' performance, health, and safety is being strongly advocated. In recent years, the WSH Council in Singapore has developed the CultureSAFE programme, which encourages organisations in Singapore to build a strong WSH Culture.[12] Safety culture is the product of the attitudes, beliefs, perceptions, and values that employees and the organisational management share in relation to safety in the workplace. It is not surprising that the key components for the development of a strong safety culture in an organisation are leadership, commitment, and good governance. The commitment to safety has to start from the top and trickle down to all employees. Teamwork, ownership, and a willingness to report accidents or incidents are also extremely important in building a culture that emphasises safety.

Challenges Ahead

To ensure that people are able to work productively and safely, their work, workspace, and environment have to be compatible with their physical and cognitive limitations. Organisations have to develop a culture that is committed to putting people's safety, health, and wellness first, in order to ensure that their workforce can be productive and efficient. Over the short history of human factors, we have seen that workstations are being designed to accommodate people of different sizes and builds; systems are gradually becoming easier and more pleasurable to use, and some are being developed to support human decision-making and often even take over the task completely. However, the work of human factors professionals is not finished. New challenges abound, such as an increasingly ageing society and the proliferation of smart and disruptive technology.

12 WSH Council Singapore 2012.

Keeping the Elderly Active and Productive

As Singapore deals with an ageing population, the government is developing new policies and programmes to enable the elderly to live a healthy and active life. It is vital to also support life-long employability; this requires a match between job demands, technology, environmental context, and the needs of elderly employees. Mismatch will result in unacceptable productivity, work dissatisfaction, and worse, compromised safety. Greater effort is necessary for an inclusive approach in designing elderly-friendly products, services, and living environments.

These are some workplace interventions to accommodate older workers: use adjustable workstations; improve lighting; minimize background noise; shift more physically demanding tasks to younger workers; and introduce shiftwork that is more compatible with the circadian rhythm of the elderly. A company that values elderly workers should be willing to invest in workplace or even job redesign to keep their older workers safe and productive.

A group of researchers from SUSS came together to investigate the issues that influence senior citizens' acceptance and usage of e-services and digital devices in Singapore. The study sought to gain better awareness in this area so that future research can explore appropriate interventions for senior citizens and improve their methods of delivery. The study led to the development of a set of user interface guidelines on designing for older adults,[13] launched by SPRING Singapore in March 2017.

The challenge in designing for the elderly is the heterogeneity in the population. For a start, it is difficult even to define "elderly" as most people age in different ways. To illustrate, some people are frailer at 65 compared to others; some are cognitively still resilient, while others may start to suffer the onset of dementia. Some older folks are physically younger and/or feel younger than their chronological age, and they would like to be active, engage with society, remain relevant, and not be treated like an infirmed dependant.

Although many guidelines and principles for designing for the elderly have been developed, discretion needs to be exercised to ensure thoughtful applications. Overly accommodating one group of elderly people (for example, by designing devices which are easy to use but lack functionality) may alienate another. Engaging the elderly and integrating their input in the design process is therefore strongly recommended.

Ageing in place resources are technologies and related services that enable the elderly to continue living at home longer. Devices can be placed in the home to track the movement of the elderly, for example; when no movement is detected, the device sends an alarm to

13 Singapore Standards Council 2016.

their caregivers. While this may seem like a great idea to some elderly people, it could be intrusive to others.

Active ageing companions in the form of intelligent robotic systems may be touted as an ideal companion; a voice-activated control system allows users to make video calls, play online games, and interact on social media. However, anyone who has interacted with Apple's intelligent personal assistant and knowledge navigator Siri, or any other voice recognition system, will know that voice-activated systems are not ready for widespread use. If an elderly person's only home companion is unable to recognize and follow his or her commands, it can cause much frustration and anxiety. Research on the impact of technology and devices that supposedly empower the elderly is lacking, but having a digital assistant or even a robot as a companion could make the elderly person feel even lonelier, as a human presence still matters.

It's About Users' Goals and Experience, not Technology

Disruptive technology is defined as groundbreaking technology that displaces current established technology and creates a completely new industry. Disruptive technology has been classified either as phased-transitional (for example, DVD replaces VHS; mp3 players replace CD players) or as technology that creates a new capability that did not previously exist.

Most people think that disruptive technology becomes successful because of the technology. But the human experience of using the technology is what actually matters. Uber, for example, is not successful just because of the app. Prior to the launch of Uber, it was already possible to book a taxi via ComfortDelGro Taxi Booking or Dial-a-Cab. Likewise, before Airbnb, online booking of hotels and accommodation was already common. What matters is the experience and the convenience of being able to always get a ride from A to B, regardless of weather, time or day, and the experience of securing accommodation at an affordable rate anywhere in the world. Likewise, cloud storage is not about where the files reside, but about the convenience of accessing the files from any systems, be it at the office, or while meeting clients, or working from home. Technology for technology's sake will not make it popular. A good human experience when using technology is important.

Artificial Intelligence (AI) will be a game changer that will greatly influence how society functions. Self-driving taxis have already debuted in Singapore.[14] Robots deliver food, drinks, and toiletries to patrons of restaurants[15] and certain hotels.[16] The healthcare

14 Liang, Annabelle & Dee-Ann Durbin 2016.
15 Ang 2016.
16 Lin 2016.

industry, another customer-facing industry, is embracing technology to improve productivity. A national platform for telemedicine now allows doctors to provide consultations to patients remotely.[17] Beyond this, AI doctors who might make a more accurate diagnosis than human doctors are being developed.[18]

Conversational interface allows users to talk to a computer, transcending the usual need to key in instructions or use gestures such as swiping. In science fiction movies, humans converse with computers like Jarvis from *Ironman,* speaking as casually as we would with another human being; the computer is able to carry out our commands and even modify them as they see fit. At present, the commercially available systems are Siri (from Apple), Google Now (Google), Cortana (Microsoft) and Alexa (Amazon Echo). Though promising, these systems are still not able to operate within the complexity of human conversation, which involves context, environment, experience, emotion, humour, etiquette, and common sense.[19]

Drone delivery systems, which are almost always mentioned as part of the Smart Cities solutions, seem more likely to become a reality. It is important to consider the commercial, legal, logistical, environmental and social impact of drone delivery. One other important question to ask is: what would be the experience of having a package delivered by drones to your home or place of work? Companies need to consider, right down to the microlevel, how customers on the receiving end of this service interact with the drones. "The details of that contact should be designed, just like the details of any great service should be. The technology isn't enough. It seldom is."[20] As always, the human experience when using technology must be factored in.

The Human Still Matters

Innovation and technology are boosting productivity. On one hand, technology seems to be replacing human involvement in the delivery of products and services. On the other hand, the involvement of the human is absolutely critical for the successful design, development, and deployment of technology. It is unwise for the human to be left out of the loop, and so human factors considerations are a must. In the pursuit of higher productivity and a stronger economy, it is important to remember that the safety, health, wellbeing, and welfare of the workers and of the general public must never be compromised. The human will always matter more than any fancy technology.

17 Lai 2017.
18 Hutson 2017.
19 Clinton 2017.
20 Saffer 2014.

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Chapter 13

Training Future Lawyers: The Multi-disciplinary and Applied Skills Approach

Leslie CHEW Kwee Hoe

Historically, Singapore's legal system owes its beginnings to the English legal system, brought into Singapore as a result of the trading activities of the East India Company. It is now well accepted that English law and the English common law were received into Singapore via the Second Charter of Justice.[1] Prior to the Second Charter of Justice, there was no established system of law, and the period between the founding of Singapore in 1819 and 1826 has been described as 'a period of legal chaos.'[2] The Second Charter of Justice not only introduced the English common law into Singapore but also established the beginnings of the local legal profession.[3] Subsequently, the Courts Ordinance of 1873 restricted admission to the legal profession to those who qualified as solicitors or barristers and those who passed the local examinations, while the Ordinance No III of 1878 established the category known as 'advocate and solicitor', which is still the case in Singapore.[4] Those who aspired to practise law in Singapore studied at universities or the Bar in England. It was not until the establishment of the Law Department, in 1957, in the then University of Malaya, that the first local law school graduates were produced in 1961.[5] Today, most practising lawyers receive their training either from the National University of Singapore law school, the Singapore Management University law school or from the scheduled universities[6] in the United Kingdom, Australia, New Zealand and the United States of America. Additionally, the degree conferred by the third law school residing in the Singapore University of Social Sciences (SUSS) will be recognised for admission to the Singapore Bar.[7]

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1 Letters Patent establishing the Court of Judicature at Prince of Wales Island, Singapore and Malacca in the East Indies, see https://commons.wikimedia.org/wiki/File:Letters_Patent_Establishing_the_Court_of_Judicature_at_Prince_of_Wales'_Island,_ Singapore,_and_Malacca,_in_the_East-Indies_(27_November_1826;_published_February_1827).pdf7

2 Tan, Kevin Y. L. 2005, Essays in Singapore Legal History: An Introduction (Essays in Singapore Legal History, ed. Kevin Y. L. Tan).

3 http://www.singaporelegalhistory.org/index.php?title=The_Legal_Profession_in_Singapore (retrieved 8 March 2017).

4 Ibid.

5 http://law.nus.edu.sg/about_us/history_milestones.html (retrieved 8 March 2017).

6 Legal Profession (Qualified Persons) Rules.

7 Ibid, rule 6, which will have to be amended to refer to the new name of SIM University, which is the Singapore University of Social Sciences.

Training the Lawyer

Historically, in England, training for lawyers (principally barristers) was provided by the Inns of Court, which are professional associations. The original approach to training barristers essentially involved a type of apprenticeship. The apprentice learnt the law through sharing, attending court, and through moot court exercises conducted by the Inns.[8] In the mid-18th Century, the Bar Examinations were established and became a requirement for admission to the Bar to this day.[9] Since the mid-18th Century when the common law also became a subject of study in universities in England, the university degree courses became the preferred and eventually the only route to becoming a lawyer. In Singapore today, the route to the practice of law is similar to that in England. An aspiring lawyer either pursues law studies in the local universities or attends one of the overseas universities whose degree in law is recognized in Singapore for admission to the local Bar.

Study of Law in Universities Today

Typically, a three-year law degree in a UK university requires students to successfully complete eight compulsory modules. For example, at University College London (UCL), the compulsory modules offered in the first and second years are the following:[10]

Year 1	Year 2
Contract Law	European Union Law
Criminal Law	Jurisprudence and Legal Theory
Property Law I	Property Law II
Public Law	Tort Law

In Year 3 of the UCL course, students will read four optional modules, which they select from a suite of electives. Similarly, at the National University of Singapore Law School, there are the usual core law modules that students have to read.[11] Both in Singapore and in the UK, the core subjects in a law programme would not vary too much. They would generally cover the fundamental areas of law, such as the law of contract and the law of torts, as well as constitutional and administrative law. It is necessary for law graduates to be

8 Appendix 1 to "The Role of the Inns of Court in the provision of education and training for the Bar", www.middletemple.org.uk/.../education-training/2inns-of-court-role-in-the-provision- (retrieved 8 March 2017).
9 Ibid.
10 See website at https://www.laws.ucl.ac.uk/study/undergraduate/llb-degrees/law/ (retrieved on 9 March 2017).

grounded in the core areas of law, which will inform their professional practice. However, these compulsory modules deal largely with the theoretical underpinnings of law rather than the practical aspects of procedure and other regulatory forms that a practitioner or general counsel will confront post-graduation.

The training of lawyers by way of the universities, with what may be termed an academic approach (as opposed to a vocational approach), presents a 'disconnect' between the training that the lawyer receives and his or her eventual vocation in law practice or industry. However, it should be immediately pointed out that this disconnect is neither the fault nor the responsibility of the universities. The problem is one of conflation. Since the advent of the university route to a professional legal career, a lawyer must first obtain a law degree from university before he or she is deemed qualified for the vocational training that would in turn qualify the law graduate to practise law. This is the case in almost all jurisdictions, particularly those belonging to the common law tradition.

A university is thus charged with the mission of conferring upon a law graduate what is essentially an academic degree. In other words, the universities that offer law degrees cannot be expected to be responsible for the preparation of the law graduate for the *professional* practice of law. Anecdotal evidence suggests that a law graduate really begins to learn to be a lawyer in the first three years post-qualification, through practice.[12] Indeed, Lord Sumption of the UK Supreme Court recently observed that studying law was "not a particularly good training for the handling of evidence, or for acute social observation, or for the exercise of analytical judgments about facts."[13] To be sure, his Lordship was not suggesting that law graduates do not make good lawyers.

The fact is that much of what a lawyer needs to do in practice does not require as much law as one might expect. Rather, the lawyer has to deal with and analyse complicated facts and complex transactions in order to reach a reasonably useful solution for the client. Frequently, this sort of factual analysis is best informed by an understanding of how the world actually works, rather than by deep legal principles or arcane law. By and large, the law works in a fairly commonsensical way. This is not remarkable, since law is after all anchored in the realities of life and human activity. However, the factual matrix in which law has to operate has become more complex. The disruptions caused by rapid advances in computer technology and new social ideas continue to throw up scenarios that even

11 See website at http://law.nus.edu.sg/student_matters/course_listing/compulsory_subject.html (retrieved on 9 March 2017).

12 The author has been a lawyer in private practice and government for some 37 years and was a managing partner of a large law firm in Singapore for some 6 years (1999 – 2005), where he oversaw the training of newly qualified lawyers.

13 http://www.thetimes.co.uk/article/lord-sumption-dont-do-an-undergraduate-law-degree-78wr085fx, 16 October 2016.

experienced practitioners find challenging, what more the beginner lawyer. The question then is: beyond the fundamentals of law, how do we provide the type of training which will best equip the law graduate to better prepare for the world of practice and life itself?

A Different Approach?

If the route to a legal career is through the earning of an academic degree in a law school, can a law school bridge the 'disconnect' referred to here? Perhaps, one way is to provide a little more learning of practical skills that are necessary in the real world beyond the classroom. Take as an example the law of contract. Frequently, the subject is taught in terms of the legal principles that underpin a contract, its formation, its discharge and the consequences of a breach. Rarely do contract law classes deal with the proof of the existence of a contract, and the proof of how its discharge or breaches actually take place. In reality, when a lawyer encounters a contractual deal, he or she needs to appreciate that while a written agreement may evidence a contract, whether various parts of it may be proven satisfactorily in court when a dispute arises is dependent on *how* the evidence is to be obtained and how it may, by that evidence, be proven. The evidential aspect of a contract and its attendant elements is the purview of procedural law. Unfortunately, the procedural aspects are seldom part of the curriculum.

In Singapore, happily, the law of evidence is a compulsory subject at NUS Law School, for example. However, here too, the emphasis is on the legal theories behind the rules of evidence rather than the procedural aspects of the law of evidence. That again belongs to another procedural subject, such as civil procedure and the rules of court. In Singapore, heavy reliance is placed on post-university training to provide the procedural aspects of the law. The equivalent of the English Law Practice Course for those qualifying to be solicitors and the Bar Practice Training Course for those qualifying to be barristers is Part B of the Bar Examinations conducted by the Singapore Institute of Legal Education.

Perhaps, one way to overcome the 'disconnect' is if the teaching of substantive law can be paired with the appropriate procedural law. In that way, a law student will be able to see how the procedure gives life to the substantive. For example, if contract law is taught together with the procedural adjunct needed to understand how a contract comes into being and how that may be proved, then perhaps a law graduate completing a course in the law of contract can obtain some understanding of how contract law works in the real world. Similarly, civil procedure or the study of the elements of civil litigation can be paired with the study of the law of contract. This approach can be applied to the teaching of other law modules as well. Taken as a whole then, such an approach to the teaching of

law can at least attenuate the 'disconnect'. Additionally, what if the instructors themselves had the requisite personal experience, either through law practice or as general counsel, to inform the teaching? Perhaps then, the study of law will be less merely theoretical and more rooted in practical reality.

This different approach to the teaching of law can also be augmented by using real-life cases, both for teaching and learning as well as for assessments. Many practising lawyers who also serve as adjunct teachers in various institutions of learning where law is taught frequently use their own real cases as the basis for discussion and in some cases, as examination questions – with the necessary steps taken to anonymise the dramatis personae.[14] The distinct advantage of law students working on problems that are based largely on real-life cases is that the teaching takes the form of a case study directly rooted in the real world, instead of being simply a theoretical scenario dreamt up by the faculty. In this connection, perhaps more of the faculty in law schools should have some experience of the practice world, either through consultancy work or actual practice prior to teaching law. While the recruitment of such law teachers may be challenging, there are examples of law teachers who fall into this category.[15]

Another innovation that can be considered is to inject a skills component in the law studies. Law students can be made to attach themselves to law firms or lawyers in practice, and to assist in actual legal work, whether for court or other transactions. This way, they will actually draft correspondence, documents and even legal arguments for court work. No doubt, designing such a course will be challenging. For the skills programme to be part of the degree course, pedagogy and standards must be rigorous. One particular concern relates to the selection of the receiving or supervising law firm or lawyer charged with the responsibility of providing the training. Practising lawyers are not necessarily trained to supervise students and to assess their performance. However, this may be met by some form of training for the lawyers who choose to participate in the programme. To further strengthen the pedagogy and rigour of the skills component, a full-time faculty member should oversee the whole programme.

One possibility is to have a full-time Director of a unit specifically set up within the law school to coordinate, supervise and manage the skills programme. It is possible that making this type of skills programme part of the degree course in the university would be

14 The author teaches a course in Arbitration at the Part B Course of the Bar Examinations, where the Dean has suggested that practitioners teaching courses should use their very own cases which they are working on as the basis for teaching. In this regard, the author has, over the years, adapted and anonymized the factual matrix of his own cases in arbitration disputes as the subject matter for tutorials and examinations.

15 The author continues to be a Consultant at Withers KhattarWong LLP. Prof Tan Cheng Han SC of NUS Law School is a Consultant at TSMP Law Corporation.

more effective than the current option of law firm attachments, internships and possibly even training contracts. This is because these current options are not structured and are often left to the discretion of individual law firms. Moreover, there is no formal assessment, and therefore the standards and rigour of the training obtained through current options are patchy at best. To this end, the School of Law at SUSS has incorporated into its Bachelor of Laws and Juris Doctor programmes, a skills training component that is worth 15 credit units, whereas a normal law module is worth only 5 credit units.

Multi-disciplinary Approach

Lord Sumption of the UK Supreme Court has made the following observation:[16]

> *"A lawyer requires many skills. Knowing the law is only one of them, and not necessarily the most difficult. Among the others, perhaps the most important is an ability to weigh evidence and to analyse facts. Most litigation depends entirely on fact and not on law at all, except perhaps for a few basic and indisputable propositions. Even when there is a real issue of law, it will usually be found to turn on the correct classification of the facts. The more arcane the facts are, the more valuable it is to have some background knowledge of the kind of conditions that produced them."*

What a lawyer needs to have is the ability to analyse complex facts, informed by his life experience. If a young law graduate cannot yet have the life experience that would greatly help the process of analysis, then perhaps he or she could be given a slight headstart through non-law modules that would allow a law student to experience real-world dynamics vicariously. For example, in order to augment the study of family law, the law curriculum can require that the student also take up a course in the social service framework of his or her jurisdiction. This will go a long way towards helping the law student appreciate how his knowledge of family law may be applied within that framework.[17] It will avoid the common problem of a young lawyer faithfully applying theoretical knowledge of family law to a real life family break-up, to the detriment of all concerned. Similarly, if a law student is made to take up a course in, say, police work, this would arguably buttress his or her appreciation of certain police procedures and how these sit with the judicial process.

This type of multi-disciplinary cross-fertilization of learning can only help enhance the law student's understanding of how the world works. In an attempt to adopt this type of

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16 Address to the Administrative Appeals Chamber, 6 October 2016.

17 At the law school at the Singapore University of Social Sciences, law students are required to take a course that introduces them to social services in Singapore.

18 The course is a compulsory subject in Year 1 and is taught by scientists from the Health Sciences Authority of Singapore.

multi-disciplinary approach, the SUSS School of Law has, for example, made it compulsory for its law students to take up a course in Forensic Science.[18]

Technology

There is no doubt that technology is the most influential factor in human development today. The digital revolution, for indeed it is a revolution, has disrupted many human pursuits. Today, hardly a day goes by without someone or some organisation reminding us that everything in our lives, including the professions and trades, will be disrupted by technology. One has only to look at the banking system. It is now postulated that FinTech will totally change the world of banking. Consider the introduction of a 'robo advisor' into Singapore, for example, which does away with the need for a human advisor.[19]

Technology and lawyers, there cannot be stranger bedfellows! One is futuristic in approach, the other steeped in a system that is essentially stuck in the past. In the common law system, which is the system applicable to Singapore, nothing is more fundamental than the system of binding precedents that rely on past court decisions to predict future solutions. In short, in the common law system, lawyers are trained to look backward, not forward. Yet, in these disruptive times, lawyers cannot escape the tsunami of technological disruption. Therefore, the training of lawyers must take this disruptive effect into account. This leads to the all-important question of what should be done to the training of lawyers so that technological disruption will not leave them in its wake.

The answer lies in the curriculum of law schools. It seems obvious that the training of lawyers should at least introduce law students to technology and the effects of technological disruptions, as well as actively encourage the ability to adapt, learn and eventually meet the disruption head on. The best way to help law students grapple with disruptive technology is to include, in the law programme, courses that will help the law student understand, cope with and ultimately leverage upon technology. For example, introductory courses that will help familiarise law students with current information technology could be made part of their law curriculum.[20] At SUSS' School of Law, as part of the introductory courses in the law programmes, students are introduced to a new start up technology just so they are aware of recent developments.[21]

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19 Business Times, 19 Nov 2016.

20 As part of the Introductory Courses that all law students must attend at the law school at the Singapore University of Social Sciences, students are introduced to 'IT essentials' which cover the use of online resources for research and management of information.

21 The founders of Intellex, a local law-based search engine technology startup, were invited to speak to and dialogue with the students.

I propose that, as part of their law programme, law students should be offered courses covering new and emerging technologies, such as FinTech and its future equivalents. Law students should also be offered courses to learn programming (or coding). There are very compelling reasons for law students to be trained in coding, not the least of which is that the ability to code would equip the lawyer to deal with and manage what is now already part of the lawyer's scope of work, at least in the case of litigation or dispute lawyers.

In the arcane world of complex litigation, many jurisdictions now provide for what is known as eDiscovery – the disclosure, through electronic means, of documents that form the evidence of a case. In Singapore this is facilitated by court directions, which provide for the discovery and inspection of electronically stored documents.[22] Regrettably, most lawyers do not realise that, in order to use this court process effectively – or more crucially, in order not to be taken advantage of by a more technology-savvy opponent, they must understand how algorithms are designed in order to facilitate the discovery of documents through electronic means.

Discovery of documents in the court process essentially involves a process in which each side tries to obtain maximum disclosure of the other side's documents in the hope of using these as evidence. Good design of the algorithm would improve the search results from possibly millions of documents. For those who understand computer technology, the design of the parameters, determining the scope of the search, and the method of the search for the relevant documents, would be extremely crucial. Unless a lawyer understands what the technical experts designing the algorithm are doing, he or she would clearly be at a disadvantage.

Conclusion

I have suggested here that the training of lawyers needs a new approach, and to this end, a number of proposals with respect to the content for training lawyers have been made. But at the heart of the matter is the training of lawyers itself. Lawyers should be trained to be adaptable and more receptive to change. As has been observed, it is not that the teaching of core legal subjects should be jettisoned, but rather that we need to ensure that the training of lawyers is aimed at "more adequately [preparing] them for legal practice in the coming decades."[23] Fortunately, this may not be such a leap for lawyers, particularly common law lawyers, such as those in Singapore. The genius of the common law system is

22 Practice Direction No. 3 of 2009 added Part IVA to the Practice Directions (2007 edition) providing for the necessary framework.

23 Susskind, Richard, Tomorrow's Lawyers, 2013 at p 137.

that, unlike the Civil Law system, which relies on fixed codes or texts, it is based on judges interpreting and in the process giving meaning to the legal principles. Unbound as it is from any code or text, the common law is able to accommodate new ideas and, yes, even new technologies.

When new technologies are invented and brought to market, the common law does not need specific changes to its constituent laws. Simply a re-look and a reinterpretation of its core principles will provide new solutions based on established principles. In like manner, the training of lawyers should ultimately inculcate in them this very core feature of the common law: that of adaptability. While all lawyers must fully grasp the nuances of the fundamental principles of the law, it is now perhaps even more important that the lawyer continually develop his or her ability to adapt. Adaptability in the lawyer's thinking process, and adaptability in the lawyer's attitude towards the search for solutions, should be the ultimate goal in the training of lawyers. As Singapore begins to make fundamental changes to prepare for the new way of working and functioning in the world, so too must lawyers.[24]

24 Recently Prime Minister Lee Hsien Loong noted that, "Our law schools will have to keep their curricula up-to-date (for) both undergraduate as well as continuing education to produce lawyers who are prepared for the demands of the new working environment" (Speech at the Opening of the School of Law building of the Singapore Management University, Today 15 March 2017).

Chapter 14

What Makes An Educated Person?

LIM Chee Han and Jonathan LEONG Yonghui

Introduction

According to a Gallup survey conducted in 2013 (Lumina Foundation 2014), more than seventy percent of North Americans think that the role of the university is to serve the needs of the global marketplace and get graduates ready for jobs. On the other end of the spectrum are those who insist that a university education should imbue within its graduates, universal human qualities that do not serve any immediate economic ends (Johnson 2015). It appears that the disagreement stems from two fundamental ideal-types of the university student – the effective worker vs. the well-rounded intellectual – and that the nurturing of one necessarily compromises that of the other. Buried beneath these conceptions is an even more fundamental set of assumptions: that there are either universal human traits that every educated person should have, or that these traits are contingent upon the economic demands of the day.

The economic-instrumental approach towards education, that it prepares students for jobs, has always constituted the dominant discourse in the Singaporean educational system. Economic instrumentalism is, however, not a unique American ideology or a Singaporean response to circumstances peculiar to the nation-state; it is the common logic found a collection of practices that universities in the West have employed to deal with the effects of globalisation (Pick 2004:100; Currie *et al* 2003). These practices include:

> *"… a growing relaxation of government control,[1] emphasis on economic competitiveness, the channelling of resources into curriculum areas that meet the needs of the global marketplace, a focus on preparing students for being part of a global workforce, and creating efficiencies in the management of the universities."*

1 In the Singaporean case, one finds, instead, an expansion in government control over Institutes of Higher Learning (Mok 2000).

The above observations show that the question of whether a university graduate should be groomed to be an effective worker or a well-rounded intellectual is not merely a topic one finds in Socratic musings beside the fireplace, but carries grave policy implications for countries deeply embedded in global capitalism. In fact, the need to define the nature of an educated person only surfaced around the 18th century (Kliebard 1986), when western societies first bore the full brunt of urbanisation, industrialisation, and capitalism, i.e., modernisation. This means that, to answer the question "What makes an educated person?" we must first make sense of those very external forces that made asking the question necessary.

To this end, we begin by rejecting the notion that education is merely a method of actualising taken-for-granted conceptions of the ideal educated person. On the contrary, in classical anthropological fashion, we argue that conceptions of the ideal-type graduate are themselves cultural products of human adaptation to external forces, and have henceforth always undergone re-assessments and re-conceptions.

In order to explore how these conceptions have evolved and in the process, shed light on how we should go about defining an educated person in the modern context, we do not seek to pre-empt what the future holds and henceforth model our graduates as safeguards against it. This is because external environments are transforming so rapidly that any attempt at doing so could very well lead to the nurturing of maladaptive individuals. In place of this, we cast our gaze into the past and seek to uncover what humans, across all cultures, have always been doing to prepare their young for adulthood. We start off with the assumption that perhaps, the problems that we are trying to reckon with are not unlike those that humanity has always struggled with, and hence there could be something that we could learn from our predecessors' collective experiences. These include notions of the educated person that have remained unchanged, and are therefore, "universal".

Education in a Risk Society

We begin our discussion with explaining why modeling students as mere economic safeguards against the future is an attempt in vain, by treating recent developments in higher education as a reflexively modern practice. Sociologists Ulrich Beck, Anthony Giddens, and Scott Lash argue that we are now experiencing "reflexive modernisation", a self-confrontational process through which modernity is being subjected to the sort of radical transformation that was directed at traditional ways of life over the past few centuries (Beck *et al* 1994). This means that the very premises on which modernisation was built are now being reassessed and dismantled. However, unlike what happened in

the first stage of modernisation, we have yet to invent replacements for what are being dismantled, namely (Beck *et al* 2003:4-5):

1. Societies as nation-states
2. Social institutions as providers of identities
3. Lifelong gainful employment
4. The independence of society from nature
5. The optimism in scientific rationality
6. Greater efficiency from division of labour

The experiential consequence of reflexive modernisation is an exceptional state of anomie, characterised not by the "unleashing of the will" (Meštrović 1988), but a nagging feeling that we are perpetually surrounded by dangers that we must manage without knowing definitively how to go about doing it. In this "risk society", we find ourselves increasingly preoccupied with the future and henceforth summon all our resources to ensure our own safety in the face of unknown adversities. The irony in doing so is that the more we seek to predict and therefore control the future, the more we learn that there is much more to be controlled, and how little we know about how we should go about doing it. These new forms of perceived dangers are collectively called "manufactured risks": *"environments for which history provides us with very little previous experience. We often don't really know what the risks are, let alone how to calculate them accurately in terms of probability tables…"* (Giddens 1999:4).

The premises of modernisation that are being subjected to transformation are those very foundations of modern institutions currently threatened by globalisation. In other words, globalisation is a key process within reflexive modernisation, and the economic-instrumentalism would therefore be one of the many strategies we have adopted to deal with manufactured risks. As those actively engaged in preparing young people for adulthood, we may find the following hard to accept: that what educational reform seeks to achieve, especially programmes, pedagogies, and policies tagged with the term "innovation", could very well be born out of a sense of insecurity at nothing concrete in particular, and are thus not unlike the act of purchasing insurance. Just as one would acquire a comprehensive set of insurance policies to deal with a range of possible dangers, educational institutions have begun to engage in what is commonly called "holistic education" to ensure that students are trained in everything, so that they could deal with possibly, anything.

We might be able to find a way out of this conundrum by reassessing how we have framed this thing called "the future". Perhaps what we think is lurking somewhere in the distant future has always accompanied the human species, and henceforth whatever pedagogical

intervention that we are putting in place may have already been practised by our ancestors for millenia; they just happen to have been dismantled by modernisation and hence erased from our collective memories. This means that the answer to the question, "What does it mean to be an educated person?" could be found in what pre-modern humans did with and for their young.

Primitive Education

The study of education in the field of anthropology has always existed, albeit implicitly, because the act of transmitting skills, knowledge, values, etc. from one generation to the next is treated as "enculturation", i.e., the process of turning a young person into a fully-integrated member of the community. Margaret Mead's comparison between what she called "primitive education" and "modern education" (Mead 1943) was therefore a deviation from the norm, but which also established the premise for an anthropology of education. In her ethnography of the Samoans (Mead 1973), Mead described how the ways through which her young respondents became adults would appear utterly radical to the modern person. Indeed, anthropologists have observed that hunter-gatherers do not seem particularly anxious about the "education" of their children (Gosso *et al* 2005). In our society where parents can spend up to a third of their salaries on tuition for their children, this may seem very peculiar indeed.

Hunter-gatherer children need to learn a lot — from having to know hundreds of plants and animals to learning how to build huts and forge weapons — in order to be able to meet their basic survival needs. Despite the enormous amount of knowledge and skills required of a competent adult, hunter-gatherer children learn through teaching themselves: from observation, imitation, exploration, and play (Gray 2009). Only occasionally do adults intervene to demonstrate how to perform certain tasks or provide a few words of advice, for example, when the children are about to hurt themselves badly or when they clearly desire some kind of instruction.

These four processes of learning can only happen if children are involved in everyday adult activities. This social arrangement allows young hunter-gatherers to engage in a loosely-structured apprenticeship of the community's socio-cultural life. They follow adults on foraging or hunting trips, they dance along with them during religious festivals, they eavesdrop on gossip about their neighbours, they sit around the fire absorbed in myth-making, and then they incorporate all these into self-directed inventive play. In a nutshell, in hunter-gatherer "schools", children get to do what adults do, but in a way they enjoy, with little intervention from instructors telling them to sit down, and be quiet.

Apprenticeship

Apprenticeship was also central to agricultural societies, although it took on a more formalised arrangement. The invention of agriculture was a pivotal stage in human history because, for the first time, we managed to produce more than we could consume, i.e., we generated surplus. This liberated a large proportion of the population to pursue crafts like carpentry, medicine, warfare, and inventing systems of writing. Learning took on a very different form because of the birth of professional craftspeople who control the processes of production and specialised domains of knowledge. Therefore, apprentices in agricultural societies had to pay (with either money or labour) to leave their homes and enter unequal relationships with designated teachers, for the incontrovertible objective of becoming a member of a professional class.

Even though apprenticeships differ across societies, they share certain universal traits that Jean Lave and Etienne Wenger (1991; Wenger 1998) characterised as "situated learning", a form of education that involves "legitimate peripheral participation" (LPP) and "community of practice" (COP). LPP refers to the process through which a learner becomes part of the COP; it describes how a new-timer first becomes accepted as a beginner in a specific profession and gradually, through practicing the craft under the supervision of old-timers, acquires the skills, values, language, etc. that allow her or him to move from the "periphery" to the "axis" of the community, i.e., from being a novice to a journeyman and finally, a master.

The key objective in Lave and Wenger's review of several traditional apprenticeship arrangements was to provide a critique of the "internalisation" model of education that dominates formal schooling. Beneath this model are assumptions that knowledge is largely cerebral, learning is an individualistic pursuit independent from cooperative practice, and thus the teacher's role is just to transfer abstract content from her or his brain to that of the student. These assumptions are cultural products of an even greater division of labour found in industrial societies: that of the separation between mental and physical labour, and the governance of the latter by the former through the increasing rationalisation of production processes. This is why, in industrial societies, intellectual work is more fruitfully rewarded, and the highest levels of education tend to be more "academic" compared to the "technical" ones.

Prior to the functional differentiation between mental and physical work, *"learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community."* (Lave & Wenger 1991:29). In other words, in the apprenticeship model

of education, learning is supervised doing amongst other doers of the same tasks within the same community; it is a practical, social, and cultural process of becoming a full-fledged member of a professional class. This objective of apprenticeship is so dominant that over time, the novice's acquisition of professional skills and knowledge begins to fade into the background and becomes an unintentional and even unconscious process. This tells us that the object of education in apprenticeship is not knowledge or skills, but rather, ways of being (Pratt 1998:83-98), and therefore the objective of education is not the effective retaining of content or a mastery of skills, but rather, the cultivation of a kind of person that could replace others within the community.

Discussion

By comparing the existential conditions of our predecessors with that of ours, we can draw certain conclusions about modern educational practices and the sort of adults that are, implicitly or otherwise, "made" from it. First, hunting and foraging led to a way of life that is knowledge and skill-intensive, but with the invention of agriculture, it became increasingly labour-intensive as our subsistence shifted from skillful treks into the wilderness to long hours of labour on fields of crops. Second, hunter-gatherer societies are relatively homogeneous, egalitarian, and stable over time, but with the invention of agriculture, a distinct class structure emerged and demographics became more diverse. Third, in hunter-gatherer societies, there was very little division of labour and henceforth a lack of distinction between domains of life, compared to our succeeding compartmentalisation of work and play, nature and society, etc. The modern way of life, in comparison, is in a perpetual state of reinvention; we basically sped up the structural transformations experienced in earlier stages of our history to create even more diverse, hierarchical, and fragmented societies.

Just like how contemporary educational reform is a response towards globalisation, the hunter-gatherer laissez-faire attitude, and the power relations that apprentices in agricultural societies enter into were all adaptations to external forces. The following descriptions summarise these adaptations found in educational practices in modernity, and the implications they carry for our conceptions of the ideal graduate:

1. We began to deprioritise hunter-gatherer modes of learning and begin to promote curricula-led training to prepare our young for labour-intensive careers. The ideal graduate would then be the rule-abiding, disciplined, and industrious adult who is good at enduring the drudgery of work.

2. Education transformed from the means of maintaining continuity within the tribe

to creating discontinuity, i.e., a way of turning children into something distinct from (and implicitly an improved version of) their parents. The ideal graduate would then achieve more than what their parents could, and be better than what their parents were.

3. We began to separate theory from practice, i.e., abstract mental labour practised in the decontextualised space called the classroom, from what is performed elsewhere. The ideal graduates would then be experts in modeling reality with abstract principles and formulae.

4. We began to teach specialised subjects to prepare students for specific jobs. The ideal graduate would then be one who is pre-socialised only for a single profession.

From the preceding descriptions, a pretty clear picture of what an ideal graduate of modern formal education emerges: she or he is a self-interested rule-follower who is able to manifest rigid abstract procedures upon a set of narrowly-defined objects. In comparison, an educated hunter-gatherer is someone who is competent in all aspects of adult life within the community: from performing religious rituals, to the care of infants; and from story-telling, to cooking. In agricultural societies, an educated person has become someone who is simply well-prepared for a specific occupation but knows little about others. A closer look, however, at the evolution of the ideal educated person, would reveal that there are certain traits that have remained unchanged, but which have been overlooked in our reflexive attempt at dealing with manufactured risks.

The pitting of the universal desirable traits of an educated person against qualities that are dependent on economic requirements, is a cultural product of a narrow conception of our environment as a specifically economic one. This is the reason why modern education is treated in an economic-instrumental manner, and why the modern ideal educated person has been constructed as an economic being. An exploration into pre-modern life has shown us that, indeed, the human species has always treated education in an instrumental manner, but the environment that our ancestors had reckoned with was a sociocultural and not an economic one. Classical anthropologists may be right, after all, in not separating "education" from "enculturation", because education has always been a way of enculturating young people into fully-integrated members of the community – regardless of whether it is a tribe or a professional class – and never a hyper-rationalised economic instrument.

This is not to say, however, that we should utterly abandon professional training. Pre-modern education had always involved training young people to be competent in their

mode of subsistence; just that learning occurs in the background unintentionally and unconsciously as an indistinguishable part of our social and cultural life. This tells us that, as we focus on turning our students into effective workers, we need to also be mindful of what our species has learnt from millennia of collective experiences, that:

1. Learning is equivalent to supervised doing.
2. The object of education is not knowledge or skills, but ways of being.
3. The objective of education is not economic proficiency, but the seamless integration into the social and cultural life of one's community.

Globalisation has had many effects on humanity, one of which is a greater awareness that the conduct of one group of people bears heavy consequences on others on the other side of the globe. We have learnt that cheap clothing in developed countries are products of sweatshops exploiting child labour, that burning forests to clear the land for cash crops would suffocate one's neighbours, and that new technologies emerging from one country would make certain skills obsolete in others. Investigating why we have turned to economic-instrumentalism to deal with all these would demand an entirely new chapter; it suffices to say here that if we try to define the ideal-type of the educated person without turning our students into insurance policies against nothing concrete in particular, we need to first explore the nature of the community we live in.

We surmise that the reason a major contender for the ideal educated person is the "well-rounded intellectual" is precisely because this person is required by and for the type of community we are part of today. It may seem ironic that the invention of agriculture and industrialisation led to splitting of the "tribe" into narrower communities of professionals and classes, yet globalisation has reversed the trend and shown us that we are all intimately connected as part of a larger "global village". What then, are the skills, knowledge, beliefs, personalities, etc., that would help fully integrate a person into the global community? The answer to that would be the answer to the question, "What makes an educated person?" Ironically, attributes like "open-mindedness", "cross-cultural sensitivity", "social intelligence", etc., commonly de-prioritised as "soft skills", are actually essential to a globalised world because they allow us to become full-fledged members of a highly heterogeneous, hierarchical, and volatile world populated by a wide spectrum of identities, abilities, and interests.

Conclusion

The pedagogical approach found in the Singapore University of Social Sciences (SUSS) reflects, to a great extent, the three anthropological lessons listed earlier. As a university that was established for working adults, practice-orientation has always been an integral

part of our curricula design. Unlike our part-time students who have had years of working experience, opportunities for our full-time students to learn through supervised doing had to be intentionally featured in our curricula. This is the reason why an Office of Career Development was set up to ensure that our students spend at least six months as apprentices, and thereafter, a final-year project that requires them to conduct research and address practical problems they encountered in the firms they were attached to. These students are also required to take their minors with working adults in part-time programmes, who would, in addition to their co-workers during work attachment, play the role of old timers guiding the novices' journey from the periphery to the axis of their professional communities.

As we train our students to be competent in their respective crafts and provide opportunities for them to acculturate to professional communities, programmes like the Common Curriculum courses and Service-learning component that nurture their memberships in the larger Singaporean and global communities are run simultaneously. Full-time students are exposed to six compulsory courses that share "humanity" as a common theme, yet employ a wide array of analytical tools with which human history, society, culture, ideas, technology, and the arts, are analysed and interlinked. This collection of social science and humanities courses lay the groundwork for the development of our students not only as independent thinkers but more importantly, sensitise them to our shared memberships in a global humanity.

Service-learning in SUSS further reinforces the lessons learnt from the Common Curriculum through practical-experiential means. Students are not evaluated on the amount of time spent on serving others, but on the quality and sustainability of their Service-learning projects. Regardless of whether these projects involve protecting the environment, mentoring youths, or conversing with the elderly, first-hand encounters with those at the margins of society compels students to reflect upon the very object of Service-learning: one's values in relation to the world. To similar ends, the compulsory overseas experience component, which could involve summer schools, work attachments, or Service-learning trips, allows them to expand this very "world" beyond the shores of Singapore.

In conclusion, this chapter has shown that the dichotomy between ideal types of a graduate is a mere cultural product of economic-instrumentalism, of separating the economic and educational domain from that of the social and cultural essential to human existence. An anthropological foray into the past shows us that learning to work effectively is merely a background process behind the larger sociocultural objective of becoming a well-rounded intellectual who finds herself or himself utterly at ease in a global community. An ideal graduate is therefore, an adept being-in-the-world.

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Chapter 15

The Place of Cultural Education

LIM Lee Ching

Introduction

The Singaporean university landscape is, to all intents and purposes, a success story whose narrative arc parallels that of the country's modern history. Developed with tremendous forward planning, periodic adjustments, and a clear-minded vision, these institutions stand tall alongside the country's many achievements. Today, its two comprehensive universities are consistently ranked highly by various authorities, while its four newer institutions, created to cater to specific areas of learning, are poised to rise to the challenge faced by institutions of higher learning throughout the developed world. These are challenges that have emerged as a result of rapid technological advancements; globalisation that is at once unifying and fractious; and shifting social and cultural paradigms that are caught in the tensions between individual impulses and the common weal (Steger 2013; Sandbu 2017). These are not new concerns. They are nonetheless ongoing issues that have an impact on the community at large, and on the work of the university by implication.

This work is made the more complicated – in fact difficult – by real world developments. As the culture wars take a turn for the insular and nativist, the challenge for institutions of higher learning attempting to prepare students for a pluralist, globalised world has become more daunting, if necessarily also more urgent. Recent world events have foregrounded the vast cultural disconnections that have boiled over into actual tensions and conflicts, impressing upon us the genuine urgency of putting in place skills that will allow for the navigation through complex – possibly challenging – cultural and social circumstances.

But the international political climate should not put us off our obligations as the bedrock on which knowledge and inventive thinking find confluence. Education, we remember, is transformative. And university education, especially, has a crucial role in transforming the minds and actions of a segment of citizenry that is traditionally expected to play a greater role in the shaping of society, and in the world in which they live. This is beyond mere economic contributions, but an active engagement in the shaping of their communities. In this, the university student, on the cusp between receiving formative education and higher order skills and knowledge, must be made cognisant of the possibilities of positive transformation that lie in their hands. Here, we must give pause to the received notion of university study as an inextricable aspect of economic imperatives. This utilitarian perspective is understandable, perhaps even necessary. But the utility of higher education need not be confined to the economic sphere. More than questions of how much money a graduate will make, it is perhaps pertinent to ask: what kind of questions will the graduate ask about the world, and thus what kind of answers he or she will find – and indeed *how* these answers will be found. The enduring intellectual life is perhaps the better measure of success, both for the student and the university.

Critical Life Skills

The empowerment of students to achieve these goals is not new to the discourse on university education. Emphases on the rigours of intellectual inquiry, both empirical and theoretical; lifelong skills of innovative, critical and analytical thought; and language proficiency – these are some of the items that are consistently at the forefront of pedagogical strategies. In fact, these skills, with varying ascriptions, have informed part of the intended goals of the Singaporean government's higher education plans, as laid out in the *Committee on University Education Pathways Beyond 2015* report (2012). These skills are crucial for the coming generations of graduates to make informed decisions about their roles in a world that is fraught with a heterogeneity – of ideas, of identities, of expectations – that both separates and connects them with the world. To be sure, universities recognise these and have responded to these imperatives by incorporating these life-enhancing skills to the syllabus. At the Singapore University of Social Sciences (SUSS), for example, critical and analytical thinking are part of a core curriculum that undergraduates are required to read as credit-bearing classes. A suite of other knowledge and skills broadening courses make up the rest of the core curriculum.

For a core curriculum – or any syllabus inclined towards the liberal arts model – to be successful, the student must be aware of the need to be confronted with immediate incongruence, as is inevitable with classes that appear unconnected with their elected

majors – the "not what I signed up for" response. For the student approaching university as the acquisition and subsequent application of knowledge, the necessity of acquiring critical skills can be made clear by directing the connections back to disciplinary relevance, even pertinence. For instance, the accountancy or financial studies student, scrutinising a company report, needs critical and analytical abilities beyond the numerical to unpack statements; or the social worker making court representations on behalf of a client needs to have good and clear language skills in order to communicate successfully and advantageously. These are, contra established jargon, not "soft" but tangible, certainly essential, skills with significant consequences that not only supplement book learning but in fact function in tandem with disciplinary knowledge. They are life-long skills, and allow students and educators alike to apprehend a society, a culture, and a history, in order to reinforce the structures that undergird these aspects of experience. These skills inform our grasp of the competing intellectual methods that go into the formation of collective identity, even of a civilisation. They dictate our senses of value and ethics. And in an age of manufactured information, these skills allow us to discriminate between fact and opinion, and avoid turning one into the other – for us and by us.

The teaching of life-enhancing skills is not a magic pill that will allow universities to find success and meet whichever benchmark of excellence that is the flavour of the day. While recent years have seen such subjects as critical thinking and creativity being injected into curriculums at all levels pre-university, anecdotal evidence suggests that they are often treated as mild inconveniences that distract from the seemingly more important work of teaching examinable subjects. Nevertheless, these constitute a good start that can offer a sense of continuity when a student encounters the same topics at the university level.

What is missing in all of these, however, is an obvious lack of sensitivity to the world around that many students entering university seem to demonstrate. In the SUSS experience, this is especially true with fresh school leavers – as compared to working adult students – who often come across as being unaware of historical, cultural and social contexts beyond those of their immediate spheres of experience. For many, even current affairs can be a remote matter outside the scope of their interest. Admittedly, this is such a perennial professorial complaint about students that it risks sounding like a cliché. And its recurrence generation after generation speaks perhaps of a genuine gap between expectation and ability rather than actual widespread inadequacies. It is a gap to be filled by the very education that students have enrolled for.

Cultural Literacy

In the 1980s, the American educator and literary critic, E.D. Hirsch (1987), garnered a lot of attention for proposing the formal and structured inclusion of what he termed "cultural literacy" into the school curriculum. By cultural literacy, he meant the ability of a person to understand, decode and encode a culture's structures of signification, its history, and narratives, its quirks and rituals, among many other aspects. Cultural literacy allows a person to interact with others of that particular culture. It can be achieved by exposure, and constant and consistent engagement with the culture through commerce, education, religion and the arts. Elsewhere in the present collection, my colleagues, Tan, Ngg, and Lim (Chapter 21) have suggested the importance of cultural and cross-cultural competence and sensitivity. These are related to the Hirschean approach to the matter. What I will set out below is a consideration of the place of cultural education, as a way to prepare the student for the demands of (inter)cultural competence that my colleagues have identified.

The crucial functioning role of culture – and cultural understanding – rests firmly on the notion of *understanding* itself. This seems obvious, even inane, but it points to a truth about how we engage with the world, and what and how it means. True understanding arrives at a moment of near epiphanic realisation of the chasm that stands between the self and the object; it is the resultant impulse to bridge that chasm. Each of us experiences this to different degrees: the process of knowing, of accumulating knowledge, and in the process constructing an ethical, aesthetical life that has the ideal of truth as objective. In all this, culture is the identifiable ground upon which we may stack our cumulative experience and learning. The place of culture is with the agitation of the intellect, to occupy the learning mind to aspire towards finding coherence among the necessary contradictions that shape the world and our involvement in it. Culture assures us that there is a place for abstractions in our day-to-day pursuits, that, indeed, it may be fine to operate in a space where material and practical goals are not central to the calculus. Culture and its implements – art, history, social practice, etc. – are ways by which we communicate and assimilate our relationships. Out of this, it also helps to develop in us a kind of instinct about relating to the other.

But how can we harness the best that culture has to offer? What does a cultural education look like? I suggest two interdependent approaches to this. The first is foundational. A cultural education cannot be left to the university to instigate. A liberal arts style core curriculum may seem attractive, but it is also a belated interventionist gesture, rather than a cultivating one. And even if a veritable cultural education in the university is successful, this is only confined to the segment of population that has access to – or is qualified for – higher education. This results in a return to something approaching elitism. No, to create

a culturally literate, even fluent, society, exposure to cultural learning must begin from the start of educational life.

Language Literacy and Culture

Language classes are a useful space to infuse with cultural content. This does not mean the mere inclusion of material from nativist cultures and cultural practices. It also calls for a turn towards global culture and cultural practices, the arts, histories, and so on. The stories and biographies found in language subject textbooks, upon which language apprehension and practice take place, are a good place to also explore cultural ideas at a formative level. In other subjects, like mathematics and science, there is nothing that should prevent the inclusion of the history of ideas and discovery, in order to provide greater cultural context to the material. The same can be done for other school subjects, such as music, art and even physical education. The addition of contextual learning – for example, examining the evolution of the rules of a game – can make for a more sensitive and aware approach to the 'doing' or playing process. To do all of these systematically, a culture-based school syllabus must have a progressive arc. While many of the ideas described above are indeed parts of the school syllabus, what may be necessary is to approach them with some coherence, from the cultural perspective. This can take the form of a trajectory that moves from fundamental exploratory awareness, to appreciation, to comparative understanding or analysis, and finally to critical engagement, with the latter stage being an aspect of cultural education at the university level – more about which, later.

At the centre of a cultural education must be reading. Literacy cannot be divorced from cultural literacy. In fact, reading is the most direct manner by which diverse cultural content can be made available. By reading, I do not mean here past-time activity – although that should also be encouraged. I mean reading in an extensive, expansive – "ferocious", "voracious" – manner, as a habit of learning. The merits of reading are indisputable and I do not intend to re-hash them here, except to say that the critical acuity, intentional sensitivity, intellectual concentration, and linguistic refinement that can be derived from it are the very bases from which cultural literacy can be built. A common complaint about the age of digital permeation is the easy access to various forms of distractions. This does not need to be an obstacle to cultivating a reading habit. In fact, technology can be harnessed as yet another avenue by which reading and reflections upon reading can occur. A community of readers formed around – and making use of – social media can be an extension from any reading programme that a school may institute. This allows the act of reading, and thinking and articulating about reading to take place on an anywhere-anytime basis that will let the process become second nature for the student.

A systematic school reading programme, with established objectives and even set quotas, need to be put in place in order to build a lifetime habit that will be fundamental to the success of a nation of lifelong learners. Most important of all, the study of literature needs to be reinstated as a compulsory rather than choice subject. This should not be left to the autonomy of individual schools, but should be a national imperative. The excuse of examination difficulties is overly convenient and gives our students no credit. Students do not do well because the subject is not taught well. Our teachers need to be trained appropriately in order to do this effectively. Here, the shift should be away from conventional "practical criticism" into deeper considerations of affective and perspectival learning – to learn not just about textual meaning but also about how meaning is produced, and to learn about the interconnectedness of ideas and, yes, cultures. The literature classroom is a safe space in which students can test ideas, to understand that differences can co-exist, and to grasp the inevitability, even necessity, of ambiguities. In this, the de-emphasis of literature in schools has been a great disservice to our students.

All this is not to say that the university has nothing to do with cultural education. On the contrary – and this is the second approach to the matter – if the foundational work to build up the fundamentals of cultural literacy is done right pre-university, then cultural knowledge and the skills associated with it can find avenues for deepening in the higher learning context. The modern knowledge environment corresponds with the skills ability of the modern student. Both are characterised by the technology-driven proliferation of information. The rise of, and our initial foreboding about, the digital agitation has settled into an uneasy balance of sorts, where traditional modes of access to information reside comfortably next to more versatile, certainly more mobile, methods. This digital ascendancy has not turned out to be the intellectual disaster that doomsayers have feared. While the effects of the technology-driven information echo chamber means that there is an inevitable inclination towards deepening rather than broadening of knowledge, technology has nevertheless also brought along the realisation of a multitude of improvements to the way that knowledge – hence scholarship – is circulated. At no other period of history is information so readily available. Information technology has given to the pursuit of learning both reach and range. If the advent of the research university in the 19th century saw the first seismic change in the way that the institution is conceived, then the present digital age must truly be the second revolution. The tremendous speed and relative openness of access has democratised education in a radical way, to the extent that the porous intellectual infrastructure appears almost set as a norm rather than novelty. Those of us in the academy find ourselves at a juncture where our pressing task is to locate the equilibrium between the timelessness that defines knowledge, and the speed – and associated urgency and validity – of information transmission.

Rising Digital Information Tide

The modern student is not stricken by such contentions. While it may be unfair to insinuate that this is a state of blissful ignorance, the contemporary learner is nevertheless residing in a position of educational ambivalence. On the one hand, digital nativism means that today's students are fundamentally equipped with the ability to locate information far better than any generation that has come before – access and acquisition is a matter of course, not exception, for them. It is not uncommon, in the present day university classroom, to find students with their computer devices open, skipping from browser tab to browser tab, picking up information resources as a lecture or seminar is ongoing. The more traditional among us may dismiss this as distraction, but the reality is that this is how learning is already taking place, and students have harnessed this infrastructure, whether we care to or not.

However, this proficiency in accessing and acquiring information has its drawbacks. In the haste, as they hurtle from one information source to another, what is sacrificed is depth. Range and reach may meet immediate learning needs, but without sufficient grounding in the fundamental processes of reinforced learning, information is merely bits of incoherent data, and does not necessarily become shaped into knowledge. The depths of learning is a deliberate, deliberated, process that forms over time, over repeated exposure, to result in the cognisance of the organic inter-relationship of things, and of ideas. While learning used to reside in the realm of striving towards ideals such as truth and meaning, today's learner is driven by objective-based processes of arriving at mere definitions and functions, reducing the binary basis of digital operations into a way of apprehending the world in a similar binary manner of "pros and cons".

While the digital tide cannot be reversed – and there are, as above, good reasons to embrace technology in education – the university must not be complicit in engendering the superficiality of knowledge and skills acquisition. Admittedly, the university syllabus is under increasing pressure to cover more and more aspects of each area of specialisation. Yet, we cannot teach the parts of a discipline in parts, and hope that students can, on their own, piece them together to form a totality. True learning is not only about acquiring and storing of information; it is about forming the information into a unity of facts and ideas that are "drawn from the innumerable centres of culture", to paraphrase Roland Barthes (1977).

Culture-based Curriculum

Here, we can return once more to the possibilities that a culture-based syllabus may provide for. Where pre-university cultural education can put in place a context for learning that allows students to examine the inter-relatedness that is derived from a heterogeneous world, these can extend to the university classroom where the approach to aspects of culture can be enacted by way of critical practice. If the formative cultural education that I have described earlier is successful, the students should be ready for deeper immersion at the third level of education. I suggest that the kind of core curriculum that is conventionally confined to freshmen programmes be liberalised sufficiently as to permeate all levels of undergraduate studies. In recognition of the spatial constraints of the syllabus, a core curriculum, where one is available, can be reconfigured away from formative, interventionist approaches – such as a compressed attempt to teach critical thinking skills, or freshman composition. Instead, these can be embedded in more expansive classes in such areas as rhetoric, philosophy both western and eastern, global arts, and ethnographies. If the formative cultural education is done right, and students have progressed from awareness through appreciation to analytical engagement with a suitable range of cultural concerns, then the work at higher education will be one that is aimed at depth. And here, the leap from analysis to critique completes a student's cultural education.

Admittedly, this should not be an end unto itself. As with so much of how learning works, a cultural education is part of a totality. And as with almost everything else, it does not – should not – exist in a silo. A cultural education opens up the intellectual vision, and allows the student to examine the world – and the variety of information that makes up our comprehension of the world – with a view of consolidation. A cultural education that has humanity at its centre can ground our sensibilities, and provide the intellectual structures upon which we can undertake the close scrutiny of knowledge. It helps us to observe the deep underlying principles and patterns on which every aspect of the human enterprise – we may call them academic disciplines – is organised. We can conjoin means with ends by allowing knowledge to unravel and evolve into its full functionality, applicable to real-world practice, fastened to disciplinary necessities, yet also available as an inextricable aspect of the totality that is the body of knowledge.

Conclusion

To achieve these, education should not just be for – and of – our youth. A cultural education requires a reconfiguration of educational policy perspectives; our very culture

of learning needs to change. Schools, educators and parents may be cognisant of the necessity of these changes, but they may also need to be made aware of the urgency by which these changes take place, given the dichotomous socio-politico-economic circumstances that have already taken root in other parts of the world. The Singapore government's recent push to change the education agenda – most significantly through the SkillsFuture initiative – is set to have a positive and substantial impact on the learning and skills acquisition landscape. It also provides a genuine opportunity to include cultural acuity as a veritable skill-set that has a place in forming and informing the future-ready student.

The university – a university – occupies a unique space in society. Many, especially those familiar with the European university tradition, will balk at the idea of the institution's dominant function as that of supplying, to the labour market, graduates with skills tailored to meet economic imperatives. Yet, the truth is that the modern university has found itself precisely in such a utilitarian position. What is often lost in the process is its more crucial and more profound role as the site for the pursuit of original thought and edifying scholarship – work that can set the course of purposeful improvement of a society and a culture. It is in cultivating sustained intellectual work, across all disciplines, that a university can best serve society. To do this, the university, and its patrons, must accept its obligations to radical – a word I use in its earlier connotations of dealing with the intrinsic nature of things, and first principles – discourse. The university has a duty to intersect rationality with idealism, in order that action and thought may come together to demonstrate the best of humanity's ongoing achievements. Critical engagement, as well as the room to encourage these engagements, is key, in order that ideas are prevented from calcification and allowed, instead, to be held in perpetual dynamic suspension, and hence continued development. This is the intellectual landscape upon which the university can best serve its constituency: the students who pass through its gates at a crucial stage in their intellectual maturity; and the society that finds itself at a point of immense historical and cultural change.

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Chapter 16

Service-Learning: Appreciating the Community as Co-Educator

Cynthia CHANG and YAP Meen Sheng

Introduction

Since 2014, service-learning has been an integral component of the learning ecology at the Singapore University of Social Sciences (SUSS) and an expression of the university's commitment to society. The first part of this chapter traces the development of community involvement and service-learning in Singapore schools over the past two decades, highlighting its strengths, issues, and unintended consequences. This discussion provides necessary context for subsequent sections, the first of which describes how service-learning at SUSS is built on this legacy, while the second part looks to the future by outlining key issues and challenges for the next phase of development.

Community Engagement at Pre-Tertiary Schools

In Singapore, community engagement has been made compulsory from the primary to the pre-tertiary levels via the *Community Involvement Programme* (CIP), launched by the Ministry of Education (MOE), on 1 October 1997. The initiative, which is part of Singapore's National Education narrative, aims to build social cohesion and inculcate civic responsibility in students as part of what Tan (2009) saw as *"the momentum of national efforts to address the widely perceived problem of a new generation of citizens who appeared to be too apathetic and disengaged from matters of public and national importance"*. Through active participation and involvement in community service, the programme aspires to help students develop a strong social conscience, and a sense of belonging and commitment to their community, society, and country via experiential learning.

The programme has undergone three phases of evolution. The first phase from 1997 to 2000 required students from primary to pre-university to serve the community for a minimum of 6 hours a year; a model which resulted in episodic community service activities. The introduction of service-learning in 2000 marked the second phase of community involvement in Singapore schools. Service-learning was adopted as a pedagogy to emphasise planning and preparation, meet real community needs, and to promote reflection in order to enhance personal development and growth. In 2005, MOE removed the minimum six-hour requirement for students in junior colleges and centralised institutes. Instead, students were given log-books to record their involvement and activities as part of the reflection exercise. This development represented a shift in assessment metrics chosen, from the earlier use of hour counting of service activities (a proxy indicator which provided no insight into the actual quality of the experience), to signal a new focus on encouraging students to articulate what they were learning from their service activities.

The third and current phase took effect in 2012 when CIP was renamed *Values in Action* (VIA) to place a stronger emphasis on the inculcation of values through community involvement. According to then Minister for Education Heng Swee Keat, students carrying out VIA were encouraged to choose community issues that they were concerned about and decide how they could make a difference through a better understanding of the issues. They also undertook personal and group reflections to discuss their experience and the role they could play in the community. Schools were also encouraged to develop 4-year or 6-year development plans for more sustainable learning.

In mandating community service education in Singapore, some unintended consequences arose. Table 1 summarises the evolution of the programme, reflecting how each reframing of the national community involvement programme responded to issues identified and unintended consequences resulting from earlier phases.

Table 1. Evolution of Community Involvement Programmes in Singapore Schools

Phase (Year)	Programme Characteristics	Outcome
Phase 1: Counting Hours (1997-2000)	Students were required to serve the community for a stipulated number of hours a year.	Episodic community service activities.
Phase 2: Making Service Meaningful (2000-2012)	Service-learning was introduced as a pedagogy to emphasise preparation, meeting real needs, and reflection. Students in junior colleges and centralised institutes were no longer required to meet the stipulated minimum six-hour requirement.	Increase in meaningful community service programmes.
Phase 3: Emphasising Values (2012-present)	CIP was renamed *Values in Action* (VIA) to place stronger emphasis on the inculcation of values through community involvement. Schools were encouraged to develop 4 or 6-year development plans to move towards more sustainable learning through community involvement.	Increase in student voice as students were encouraged to choose community issues they were concerned about, understand the issue, and decide on their choice of action. Increase in progression of student learning in community involvement over the course of a student's years of study.

Community Engagement at Institutions of Higher Learning

The adoption of community service and service-learning in institutions of higher learning has grown steadily since the concept was first championed in Singapore by the National Youth Council in 1999 and adopted by MOE in 2000. Although MOE does not stipulate compulsory community engagement in tertiary institutions, most institutions have consciously woven themes of community engagement into selected courses, student programmes, or other aspects of the student experience. Since 2000, students in many institutions of higher learning have been introduced to service-learning by participation in the National Youth Council's *Youth Expedition Project.*

While community service remains voluntary in most local universities, in 2000, the Singapore Management University made it a graduating requirement for students to complete 80 hours of community service. In 2001, faculty at the National University of Singapore introduced a few course options that incorporated service-learning. By 2005, service-learning was introduced as a graduating requirement for all pre-service student teachers at the National Institute of Education, and as a significant milestone of Student Life at Republic Polytechnic. In 2014, when SUSS (then named UniSIM) commenced its full-time undergraduate degree programme, service-learning was incorporated as a graduating requirement. By 2016, Ngee Ann Polytechnic had committed to having every diploma course it offered include at least one module with a service-learning element.

Strengths, Issues, and Unintended Consequences

Some unintended consequences arose with the growth of community service or service-learning at educational institutions. Mandating community service with stipulated hours resulted in some students treating community service as an obligation and a requirement to fulfil, rather than as a sincere service to community. A common concern raised was the lack of genuine passion in students who engaged in community service only to meet graduating requirements. Anderson (1999) highlighted that some youths might resent the mandatory requirement and develop a negative attitude towards service as they did not find meaning in their experience.

The mandatory nature of community service and service-learning in Singapore could lead to a perceived lack of control and autonomy over the planning, implementation, and evaluation on the students' part, resulting in students feeling alienated from the experience. This was echoed in a study by Clary and Snyder (1999) who found that mandating community involvement for university students might counter future intentions to serve as they perceived themselves as having less control and as being subjected to more external pressure. A seldom raised but equally crucial issue relating to mandatory service is the possibility of unwilling students creating negative impact in the community.

Despite these possible unintended consequences, support for compulsory community service education in Singapore remains. This stems from the view that this method is the only way to ensure that young people – who might otherwise never choose to do so – have opportunities to engage with the community. When done well, Singapore's widespread institutional support for mandatory community involvement can also be seen as one of its strengths; it can act as a social leveller, ensuring that all students, regardless of their background, have the opportunity, structure, and encouragement to move out of their comfort zone, and be exposed to various community issues, needs, and opportunities to serve and grow.

A second issue in community service and service-learning in Singapore is the unequal balance of power between educational institutions and community organisations, which receive student volunteers. In the pre-tertiary education landscape, with reference to Table 1, programme refinement of the community involvement programme has largely been confined to the purview of MOE, which takes full ownership over the design of all iterations of the national approach to community involvement in schools. At institutions of higher learning, institutional considerations and constraints such as conforming to the academic calendar or assessment administration tend to be the primary determinants of how community service and service-learning requirements are structured.

Butin (2003) highlighted that while there were many studies concerned with the learning outcomes and benefits of service-learning for the students, there was limited study and understanding of the role of the community in service-learning, and the impact on the community due to service-learning. This reflected a lack of institutional emphasis, practitioner awareness, and the community partners' lack of voice with regard to the role of community in service-learning. Without the representation of community voice in the design of community service or service-learning programmes and requirements, implementation of the mandatory VIA from primary to pre-tertiary levels, combined with other mandatory community engagement requirements at the tertiary level, could result in large numbers of service activities that could be potentially disruptive to the community. Community organisations still struggling to meet the needs of their beneficiaries are now also faced with juggling the requests by and projects of student volunteers who may lack insights and commitment to conduct sustainable service and projects that could meet the real needs of the community. Situations like these are lose-lose for both community and students.

That the unequal power balance prioritises the concerns of the educational institutions should by no means be taken as a given, yet this practice is seldom questioned and is accepted as a matter of practicality. The voices of community organisations and the role they see for themselves in community service and service-learning should not be relegated to an afterthought. Since social issues do not exist within a vacuum, efforts in service-learning programme design and redesign must be connected to the larger ecosystem within which social issues exist, including, most crucially, close connections to and input from community practitioners.

A third issue is the as-yet-undetermined value and impact of community service and service-learning in Singapore. Community partners have voiced their concern that educational partners were unrealistic when they looked for immediate progress and results in partnerships, as real changes can only happen through relationships that are built over the long term. Meaningful community engagement requires time and immersion for one to build the relationships required to fully appreciate the complex ecology of a social issue

or social group. Recognising that the relationship between educational institutions, staff, students, and community partners is one of interdependency, is critical for meaningful and impactful service that is beneficial for all stakeholders.

Defining Service-Learning

In Singapore, with each phase of evolution of the national community involvement programme, and with MOE recommending service-learning as one approach to VIA, the term 'service-learning' gained more acceptance in educational institutions nationwide. Presently, there is a small but growing number of practitioners engaging in service-learning in Singapore. However, despite the term 'service-learning' being used in Singapore for close to two decades, many stakeholders continue to confuse community service and service-learning. This can be traced back to stakeholders' persistent impressions of the national community involvement programme's roots in community service, despite moves to adopt service-learning as a pedagogy in later iterations. To complicate matters, there is no singular definition of service-learning globally – though there are some more commonly accepted definitions, the term means different things to different groups.

In North America, while the term service-learning was first articulated as a concept to describe the combining of community service experience with "conscious educational growth" in the 1970s, service-learning only gained more momentum in the 1990s, when the United States Congress passed the National and Community Service Act, authorising grants to support service-learning. Since then, its practice has proliferated across all levels of education in North America, and more recently, around the world, with Kuh & Schneider's (2008) educational research showing service-learning or community-based learning to be one of ten high-impact teaching and learning practices promoting student success in higher education. Despite this validation, service-learning as a field is still evolving, with definitions, core principles, purposes, and practices still fiercely debated.

The United States of America's (USA) government programme, 'Learn and Serve America', acknowledges that *"service-learning has not yet settled into a shared vocabulary, a set of common ideas and theories and a general accepted approach to validation. This has encouraged a great deal of experimentation, discovery and local adaptation, but is also impossible to have one definition for all service-learning programmes"*. Indeed, Stanton (2009) identified more than 165 different published definitions of service-learning. In Butin's (2005) analysis, he found that some authors have posited that service-learning is both pedagogy and philosophy, and a complex concept best served by multiple models of origin and through research, pedagogical discussion, and the critique of a variety of theoretical models. Thus this diversity can be viewed both as a concern and a strength.

However, mutual respect for practitioners with differing definitions of service-learning is not a given. To enable this diversity to become a strength, it is important for educators, students, community partners, and institutions alike to develop both an awareness of and mutual respect for the diversity of service-learning approaches.

In Singapore, given widespread institutional support for service-learning as pedagogy, discussions about the diversity of definitions of service-learning as philosophy, particularly when applied locally, have been minimal. It is, however, an important discussion to have as it has implications on our core principles, purposes, and practice of service-learning in our institutions and communities. As more schools, institutions, and community organisations begin to adopt or consider adopting service-learning, there is a growing urgency to raise awareness about this diversity of definitions and practices in service-learning so that practitioners may be more conscious about the considerations in designing both the pedagogy and philosophy underpinning their service-learning programmes.

Key Elements of Service-Learning

In SUSS, as with some other service-learning practitioners in Singapore, two key elements differentiate service-learning and community service. First, Stanton's (1999) principle of reciprocity – *"I serve you in order that I may learn from you. You accept my service in order that you may teach me"* – attempts to level the power relations between participants, the university and the community. Prakash and Tan (2015) described Singapore's giving culture as a well-established tradition of community philanthropy that has shaped Singapore in its journey to nationhood. Combined with what Ang (2017) noted as the "many helping hands" approach to community services and a national community involvement programme that grew out of community service, the power balance has always favoured the one doing the giving. The principle of reciprocity challenges the notions of who is serving and who is being served, who is teaching and who is learning. It requires humility and respectful engagement that not only preserves but enhances the dignity of the community. Members are seen as people with strengths from whom others can learn, not just recipients with needs to serve.

Second, reflection is an integral part of SUSS service-learning experience. It helps participants make sense of their experiences, challenges personal assumptions and beliefs, is contextualised to meet specific situations and experience, is connected to curriculum, is continuous and regular, and involves critical analysis and understanding of community. Three other elements are equally crucial in either community service or service-learning, although how they manifest themselves is often a matter of individual educators' style and programme priorities. One, meaningful service requires that both the participants and

community members get to define what they consider meaningful. Two, student voice empowers participants with space for self-directed learning. Three, community voice refers to respecting the community as co-educators, honouring their perspectives in the design, delivery, reflection, and evaluation of programmes, and the amplification of the community's voice, and their concerns and priorities, through advocacy.

Principles of Good Practice for Combining Service and Learning

In the absence of a singular definition for service-learning in the USA, a guide emerged for its practice in the lead-up to the passing of the *National and Community Service Act* in Congress. Recognising, as the level of interest grew, that there was an urgency for the practice of service-learning to be guided by a set of principles and ideas by which programmes could be designed and efficacy measured, a practitioners' advisory group, in consultation with over 70 organisations involved in service and learning, composed Honnet and Poulsen's (1989) *Ten Principles of Good Practice for Combining Service and Learning:*

1. engaging people in responsible and challenging actions for the common good;
2. providing structured opportunities for people to reflect critically on their service experience;
3. articulating clear service and learning goals for everyone involved;
4. allowing for those with needs to define those needs;
5. clarifying the responsibilities of each person and organisation involved;
6. matching service providers and service needs through a process that recognises changing circumstances;
7. expecting genuine, active, and sustained organisational commitment;
8. including training, supervision, monitoring, support, recognition, and evaluation to meet service and learning goals;
9. ensuring that the time commitment for service and learning is flexible, appropriate, and in the best interests of all involved; and
10. committing to program participation by and with diverse populations.

Despite attempts to improve upon this list, it remains the primary set of principles against which service-learning programmes are benchmarked.

Role of Institutions of Higher Learning

Given Singapore's small size, each educational institution's policies on community engagement in education create systems, structures, and cultures that have an outsized

impact on the national community engagement landscape. The issues and unintended consequences observed in earlier phases of community engagement highlight the weight of responsibility borne by institutions in the decision to mandate requirements for community engagement. It is thus imperative that universities recognise the social responsibilities they bear to the community engagement ecosystem. As such, when SUSS incorporated service-learning as a graduating requirement in its full-time undergraduate degree programmes in 2014, the strengths, issues, and unintended consequences observed in earlier phases of community engagement played a crucial role in the university's service-learning programme design.

Service-learning at SUSS starts with a first semester of pre-service preparation, including a *Foundations of Service-Learning* workshop, a service-learning fair, talks by resource persons, senior students and community partners, learning journeys, and staff consultation sessions. Students are encouraged to use service-learning as a platform to make connections between their prior experience, interests and skills, their first-year common curriculum courses, their professional majors, and issues of social responsibility relating to a social issue or community group of their interest. They synthesise and capitalise on these connections to propose a service-learning initiative that is to be sustained over a period of at least two years.

Respecting both student voice and the role of community partner mentors as co-educators, students, community partners and staff discuss the contents of the proposal such as the service and learning objectives, project description, frequency, and duration to ensure that it takes into account the needs of all stakeholders before coming to an agreement. Students may propose service-learning initiatives in a diverse range of forms: individual or group, direct or indirect service, project-based or on-going. No one service-learning project type is considered better than others. Students may also explore global concerns related to their local service-learning through an *International Service-Learning* (ISL) project. The ISL is usually related to students' local service-learning project either by the social issue, community partner, or skill-set required. Students are encouraged to explore ISL collaboration with their local community partner, e.g., organising a combined ISL project with the possibility of including local community members.

Clary and Snyder (1999) proposed that a general requirement for students to participate in community involvement, coupled with a sense of personal control and empowerment, would likely encourage students to sustain their interest in future service and can mitigate the negative consequences of mandatory community service. At SUSS, service-learning is non-credit bearing and service hours are self-recorded and not subjected to assessment. There is no minimum number of hours that students have to fulfil. The rationale for this is twofold. One, to enable students to negotiate a service-learning commitment with their community partners that prioritises the needs of the community over institution-

mandated requirements for service-learning; two, to allow for a balance between the needs of the community and a realistic and sustainable engagement frequency for the student when the commitment level of a service-learning initiative is co-designed with a community partner. This approach attempts to avoid the issues identified earlier by amplifying two key elements of service-learning: student voice and community voice. This emphasises the intersection of the two, enabling students and community partners to propose student and community co-directed and co-driven service-learning initiatives.

In building the core of this programme around the concept of reciprocity, the learning in service-learning at SUSS does not, as is commonly articulated in other service-learning programmes, refer exclusively to academic knowledge or professional skills, but more broadly, to learning to serve. Through continuous reflection to make sense of their role in the community, students are challenged to clarify what social responsibility means to them personally, and to articulate how it influences their personal approach to life, work, play, and relationships with others, taking into account their unique talents and passions, the world's needs, and the reality of meeting one's economic needs.

SUSS' Service-Learning Collaboration Ecosystem

Service-learning requires a true appreciation of the community as a co-educator and a willingness to embrace the implications of this view, particularly in how educational institutions design, define, and assess service-learning, and how community organisations see the role of educational institutions and students in relation to their work. If service-learning is characterised as the interplay of service and learning, not only within individual projects but also within the broader institutional goals of community engagement, then social responsibility through service-learning is not the sole domain of students. There is a social responsibility for institutions of higher learning to serve society in ways that are unique to its strengths as an educational institution.

Since the first SUSS Service-Learning Speaker Series in 2015, SUSS has continued to serve society as an open community resource in service-learning, partnering Youth Corps Singapore to host the national Service-Learning Conference, and offering a Graduate Certificate in Service-Learning to better support the service-learning ecosystem, facilitating collaboration between practitioners from the education, and community and social services sectors through professional development. Regionally, SUSS became a member of the Service-Learning Asia Network in 2015, and is serving as Secretariat from 2017 to 2019 leading up to SUSS's hosting of the 7th Asia-Pacific Regional Conference on Service-Learning in Singapore.

As Brown (2001) described, service-learning at SUSS has expanded the institution's, staff's, and students' participation in community, not only through the service-learning initiatives of its students, but also through the university's service as an open community resource. Institutional evolution both in how the university serves and what it seeks to learn from the community through its service, demonstrates its appreciation for the community as co-educator, role modelling the vision of inclusive education.

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Chapter 17

Towards an HR Science: The Marriage of Technology and Human Enterprise – Consummate Partners or Strange Bedfellows?

CHAY Yue Wah and Yvonne MCNULTY

> *"It has become trite to say that the most significant developments of the next quarter century will take place not in the physical but in the social sciences, that industry – the economic organ of society – has the fundamental know-how to utilise physical science and technology for the material benefit of mankind, and that we must now learn how to utilise the social sciences to make our human organisations truly effective."*
>
> McGregor (1957)[1]

Introduction

Is management, in particular, human resource (HR) management at a crossroads?

MacGregor's vision (above), formulated in the 1950s, predicted that the future of management thinking would emanate from a crisis very similar to what most businesses face today – a tendency to neglect, even ignore, the human component in managing companies and the people who work for them. Sixty years on, his vision remains largely unfulfilled, with several research studies highlighting that, while organisations have indeed heeded the call and transformed the way people are managed to achieve better outcomes, a great deal more still needs to be done. Lessons of the past and the current status of poor employee engagement, decreased job satisfaction, and low worker productivity attest to the dire need for improvements in the way companies manage their people.

1 McGregor D 1957. The Human Side of Enterprise. The Management Review 46(11):22-28.

What does this mean for us as human resource management (HRM) educators? While the fundamental idea underlying McGregor's vision is the marriage of technological innovation with humanity, the missing link in the technology-strategy-HR domain is, and remains, the human side of enterprise. McGregor's vision succinctly describes the pathway for our own future at the Singapore University of Social Sciences (SUSS), bringing forth a new model and template for the development of our education programmes and HR graduates of the future. That future is undeniably linked to two recent global trends that have already significantly impacted the future of HR. The first concerns the rise of digital technology; the second, analytics. Both are reshaping the way we think about *organisations*, their *workforces*, and the *HR science* that manages them.

In this chapter, we discuss how digital technology and analytics spur new ways of thinking about careers in HR. At its core, the HR career of the future is not just about administration and policies. Rather, it requires HR professionals who are practised in the science of people management, and are ready to take on the dual roles of *steward* and *designer* of new people processes.

Digital Technology

The first significant global trend that will impact the future of HR is *digital HR*, which is transforming the HR profession in ways that were unimaginable even ten years ago. A good example is the increased usage of online labour platforms amongst people looking for work, and the rapidly expanding types of workforce that use them.[2] HR industry commentators suggest there is no shortage of online dialogue about people and machines working together and the impact this has on the future of the HR profession, which is one of the most discussed topics in HR media currently.[3] By bringing together social, mobile, analytics, and cloud (SMAC) technologies, digital HR is revolutionising the profession through *digital disruption*, and by doing so creating improvements in the candidate experience and the softening of barriers between work and home for employees. Many industry insiders predict that the adoption of mobile HR technologies will enhance companies' productivity and data quality to an extent rarely seen with traditional HR platforms. Yet these same insiders lament a lag in the adoption of digital HR by most companies:

2 Kuhn K & Maleki A 2017. Micro-Entrepreneurs, Dependent Contractors, and Instaserfs: Understanding Online Labor Platform Workforces. Academy of Management Perspectives, doi:10.5465/amp.2015.0111.

3 See, for example, Ford M 2016. Rise of the Robots: Technology and the Threat of a Jobless Future. New York, NY: Basic Books.

> *"[While] there are more than 7 billion mobile devices in the world, and more than 40 percent of all Internet traffic is driven by these devices, HR teams remain far behind in deploying mobile solutions. Fewer than 20 percent of companies deploy their HR and employee productivity solutions on mobile apps today."*[4]

Industry thought-leader Josh Bersin,[5] at Deloitte, notes that the new vision for digital HR is impressive, being designed not only to redefine the employee experience and make work easier and more rewarding – while (hopefully) improving work-life balance – but to also transform the HR profession itself in terms of what HR practitioners actually *do*.

Consider, for example, if the 'human' in 'human resources' was replaced by a robot. What would it mean for the HR function? Tavis (2015)[6] argues that while technology – and robotics in particular – will likely have an impact on jobs, she does not predict that employee numbers will decline as much as jobs will change for the better. Citing call centres as an example, robotics is expected to automate basic work functions, leaving employees to handle higher level, more complex tasks. The same could be said, more generally, for any industry.

Despite obvious benefits, the adoption of digital HR by companies is slow. Deloitte's *Global Human Capital Trends Report* (2016) found that only 38% of companies were thinking about it and only 9% were "fully ready". Such reluctance could be explained by a lack of qualified HR professionals able to take on the task, which is no small feat considering the digital HR skills required: an ability to partner with IT, experience in design thinking, implementing and utilizing integrated analytics, and carefully analysing and selecting vendor solutions. Acquiring the digital HR skillset may seem insurmountable to some, while creating innovative career opportunities for others.

A further challenge is the likely reluctance of employees at having their work life interfere with their personal life; mobile technologies have notoriously dissolved the barriers between work and home meaning they are now accessible 24/7.[7] A careful balance is therefore needed between the possibilities that digital HR presents and the design thinking behind them: the user experience must minimise work-home intrusions while maximising work-career agility and flexibility.

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4 Stephan M, Uzawa S, Volini E, Walsh B & Yoshida R 2016. Digital HR: Revolution, Not Evolution (http://diginomica.com/2017/01/05/hr-people-dont-just-digital-digital-2017/)

5 Bersin, J, Mallon D, Barnett L & Hines J 2016. Predictions for 2017 - Everything Is Becoming Digital. London, UK: Bersin by Deloitte.

6 Tavis A 2015. The Future of HR and the Rise of the Machine. (http://www.advantageperformance.com/the-future-of-hr-and-the-rise-of-the-machine/)

7 Nam T 2014. Technology Use and Work-life Balance. Applied Research in Quality of Life 9(4):1017-1040.

Analytics

The second significant global trend that will impact on the future of HR concerns what might be considered as applying a scientific methodology to HR practices. The art and science of *analytics* has been an emerging discipline in the last decade.[8] Applied to HR, it offers a whole new meaning and dimension to the scientist-practitioner model of HR practice, conferring legitimate value to the HR professional. HR analytics refers to applying analytic processes to the human resource department of an organisation in anticipation of improving employee performance and therefore getting a better return on investment from an organisation's human capital assets. HR analytics is founded on data-driven analytics processes and aims to provide insights about people-related issues such as employee performance, evaluation, recruitment, leadership, hiring and promotion, job and team design, and compensation. It is concerned with gathering data and using it to support and/or make decisions about how to improve these processes, and to envision their outcomes (*predictive* analytics).

Undoubtedly, analytics is the methodological and philosophical toolbox of future HR, and is here to stay. What does all this mean for training institutions, professional HR societies, and universities? In essence, analytics is akin to retooling the know-how, and more importantly the mindsets, of current and would-be HR professionals. It does not mean that the older generation of workers will be put out to pasture, or that the HR professional will be over-burdened with new responsibilities in addition to the old. Rather, analytics helps to guide better decision-making and employee performance, and to re-focus people as human capital assets.[9] Future HR based on analytics is less concerned with HR accounting (HRA; methods of accounting for an organisation's human assets)[10] as it is with determining the best way to use those assets for an anticipated outcome. HR will still do what it always has, but in better and improved ways, thanks to analytics.

But increasingly, HR, too, will be required to use analytics to demonstrate why it is a significant and worthwhile partner in the business enterprise; that is, to demonstrate its value and to establish its kudos.[11] As the digital HR world becomes reality and analytics becomes a core (HR) competency, a key challenge will be to recruit and hire graduates for the future of HR work. A first step is for more companies to set up their own internal HR

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8 Fitz-Enz J 2010. The New HR Analytics: Predicting the Economic Value of Your Company's Human Capital Investments. New York, NY: AMACOM.

9 Russell C & Bennett N 2015. Big Data and Talent Management: Using Hard Data to Make the Soft Stuff Easy. Business Horizons 58(3):237-242.

10 Flamholtz E 1985. Human Resource Accounting: Advances in Concepts, Methods and Applications. San Francisco, CA: Jossey-Bass.

11 Rasmussen T & Ulrich D 2015. Learning from Practice: How HR Analytics Avoids Being a Management fFd. Organizational Dynamics 44(3):236-242.

data initiatives and teams, and to develop skills that enable them to engage operationally and strategically to develop better methods and approaches.[12] Bersin suggests that doing so will reveal that analytics is much broader than just the HR function and that the HR data the company holds is, in fact, part of a much broader agenda of business problem-solving.

As trendy as analytics may seem, a challenge it presents is the balancing of the requirements of analytics' technical rigour with the human element in decision-making. Such balance will ensure that the outcomes of decision making support the needs and functions of an entire business. Our challenge at SUSS is to acknowledge and adapt to the changing HR landscape, meaning that our thinking and therefore our training, education, programme curriculum, and outlook must also change to ensure we can educate and 'future-proof' our HR graduates with digital HR and analytics competencies at the forefront.

The Context of HR in Singapore

We earlier cited McGregor's vision to set the backdrop for this chapter and to highlight the present business landscape of HR in Singapore, and Asia more broadly. As Charles Dickens famously wrote in *A Tale of Two Cities,* the current state of HR education and training can be summed up as being "the best of times and the worst of times".

It is the best of times because we have at our disposal innovative ideas that allow and equip us to set our own course. It includes the availability of technology to drive new HR activities, the automation of HR functions through HRIS and ERP systems which are already de facto systems or setups for larger companies, the accessibility of data, and an abundance of data mining opportunities. The major global consulting companies portend an era of technology-driven HR activity, designer organisations, new workforce cultures, and the onset of an HR digital revolution. The new vision is centred on digitisation, with digitalisation to follow. Mobility Apps is the new watchword, the preferred channel of operations and activity.

It is also the "epoch of incredulity", as many companies remain rooted in what they do and how they do it, frequently to their detriment. These companies maintain outdated business methods and HR operational approaches resulting in ineffective talent and people processes.[13] Others bemoan that HR lacks imagination and initiative, preferring

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12 Angrave D, Charlwood A, Kirkpatrick I, Lawrence M & Stuart M 2016. HR and Analytics: Why HR Is Set To Fail the Big Data Challenge. Human Resource Management Journal 26(1):1-11.

13 Rikhof R 2017. "HR Transformation" is Dead. Long Live Disruptive HR – How We Evolve to Next Generation HR. Geneva: KennedyFitch.

instead to rely on conventional wisdom, procedures, and processes by continually doing similar things and implementing familiar policies.[14] The strategy is at best inefficient and at worst, largely ineffective. Is it any wonder it is simultaneously the worst of times?

In Singapore, as elsewhere, those assigned into HR roles have been accused of doing a bad job, being *un*strategic, and little more than "a necessary evil … that blindly enforces nonsensical rules, resists creativity, and impedes constructive change."[15] In short, people do not like HR much and people assigned HR roles often detest the job. Driving this dismal professional outlook is the fact that most HR professionals in Singapore do not hold HR-related qualifications. The general thinking goes that because HR is so functional and operational, it can be outsourced to non-HR degree holders.

Consider by way of example a survey commissioned by the Singapore Workforce Development Authority (WDA; 2007), conducted by Binder Dijker Otte & Co Raffles Consultants,[16] reporting that while there were some 22,000 HR professionals in Singapore, the HR sector here currently depends heavily on non-HR trained professionals to meet the demand for HR practitioners: tellingly, more than 75% of those possessing a bachelor's degree (63%) were from non-HR fields. In another study of HR professionals, the Singapore Human Resource Institute (2010) reported that 41% of respondents considered that their lack of formal HR education was the main barrier hindering advancement in their career; 79% did not have professional certification or accreditation in HR.

The demand for HR practitioners in Singapore is evident and is reflected in initiatives by the Ministry of Manpower (MOM) to further develop the human capital profession and HR services industry. HR has been growing rapidly in tandem with Singapore's development as a centre for finance and business. Recently, HR has also taken on an increasingly strategic dimension as organisations come to recognise employees as critical assets and a source of competitive advantage. But is this enough? Keith Hammonds, Deputy Editor at Fast Company,[17] explains it this way:

> *"The problem, if you're an HR person, is this: The tasks companies are outsourcing – the administrivia – tend to be what you're good at. And what's left isn't exactly your strong suit. Human resources is crippled by … 'educated incapacity': You're smart, and you know the way you're working today isn't going to hold 10 years from now. But you can't move to that level. You're stuck."*

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14 Beer M 1997. The Transformation of the Human Resource Function: Resolving the Tension Between a Traditional Administrative and a New Strategic Role. Human Resource Management 36(1):49-56.

15 Hammonds K 2005. Why We Hate HR. Fast Company (https://www.fastcompany.com/53319/why-we-hate-hr).

16 http://www.mom.gov.sg/Documents/Speeches/facesheets-on-wdas-initiatives.pdf

17 Hammonds K 2005. Why We Hate HR. Fast Company (https://www.fastcompany.com/53319/why-we-hate-hr).

How do we solve the problem of insufficiently trained professionals entering a profession that has been deemed 'critical' to Singapore's future success? In an opening address at the Singapore Human Capital Summit in September 2013, then Acting Minister for Manpower, Mr Tan Chuan-Jin, emphasised the importance of and need for HR education and HR-trained practitioners. More training places for HR professionals are essential to cater to future demand and challenges in human capital management. The minister emphasised that "good leaders need the support of top quality HR professionals who can put in place good human capital practices."[18] The increasing demand for HRM is also reflected in MOM's initiatives for national HR capability through an emphasis on training programmes, institutions, scholarships, and resources for HR professionals and business leaders.[19]

Getting from HR Management to HR Science

Boudreau and Ramstad (2007) take aim at traditional HR by arguing that it must re-focus from a near-universal decades-long reactive mindset of planning, budgeting, hiring and training to instead embrace a future that lies in strategic 'talentship'. In moving "beyond HR", they argue for a paradigm shift away from functionality towards human capital management that strategically *adds value*.[20] Such 'talentship' requires a departure from focusing only on delivering high-quality HR programmes to instead aligning the HR function around the quality of talent decisions. Where else is a greater impact to be found, arising from the marriage of technology with the human side of the enterprise, than in the high-quality decisions made about people?

What, then, is HR science and how is it different from traditional HR management?

HR science is the combination of hard and soft approaches to HR with the aim of finding a balance that is *rigorous, relevant,* and *right* for a company. Commentators and scholars have for a long time debated the merits of adopting a 'hard' versus 'soft' approach to HR management; should HR act as a lion, or a sheep? At one extreme, hard (or strong) HR management is often interpreted and perceived as fact- and evidence-oriented, coercive, combative, and threatening while being rule-bound, detached, and regulatory. It gets the job done, but at what price? And where is the humanity? At the other extreme, soft (or weak) HR is frequently viewed as open, subjective, intuitive, self-directed, and participative,

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18 http://www.mom.gov.sg/newsroom/Pages/Speeches.aspx. Accessed on 2 February 2013.

19 http://www.mom.gov.sg/employment-practices/skills-training-and-development/national-hr-capability. Accessed on 2 February 2013.

20 Boudreau J & Ramstad P 2007. Beyond HR: The New Science of Human Capital. Boston, MA: Harvard Business School Press.

resulting in harmony and consensus; as well as permissive (and perhaps boundary-breaking) behaviours. It also gets the job done without offending anyone, but again, at what price? And where is the science?

HR science neither rejects HR as an art, nor insists it is only a science, but accepts and integrates both. It embraces both "the simplicity of science and the complexity and confusion of practice."[21] At SUSS, we adopt a similar principle by insisting that our programmes engender students with a head *and* a heart – both science *and* art. As others have said, *HR is an art but you should act like a scientist*. At the core of HR science is the undeniable notion of humanity; that "HR is all OB";[22] and that when dealing with people there are likely to be a tremendous number of factors that will influence their behaviour (art) as well as impact on business outcomes (science). While people issues will invariably dominate the running of any company (e.g., in concepts related to motivation, engagement, leadership, and personality), it is in the science of HR that these same companies will be able to rigorously monitor and adapt relevant HR processes to more effectively manage people in their various roles and functions. The combination of art and science – of *head* and *heart* – enables the same companies to reap the expected rewards from their people and to run a *successful* company.

At SUSS, we know that the balance and integration between technology (a hard 'science') and HR management (a soft 'art') requires that we temper the hard decision-science approach of our curriculum with the softer, more sensitive human component that is an essential constituent of a business workforce. We aim to produce graduates armed with current knowledge and competencies that strike a balance between scientific method and the human side of the enterprise. Our goal is to build a HR-qualified professional skilled in HR science, grounded in business, finance and social behavioural disciplines, and with specific domain knowledge of HR. It requires our graduates to embrace technology, to contribute to their organisation's domain specific knowledge relevant to their HR specialty, and to exhibit a sizeable dose of humanity, ethics and morality in dispensing HR expertise.

How might we do this?

First, we acknowledge that the HR landscape is clearly changing, evident from the increasing numbers of articles, journal papers, blogs and reports extoling the 'new face' of HR in business practice. On the one hand, the traditional, conventional, and functional concepts, models, methodologies and HR approaches remain very much embedded in

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21 Dipboye R 2007. Eight Outrageous Statements About HR Science. Human Resource Management Review 17(2):96-106.

22 Ibid.

many organisations and in the mindsets of most practitioners, a reflection perhaps of the powerful enduring legacy of reinforced work habits. But as scientific developments in all spheres of industry continue unabated while unremittingly pushing the boundaries of digital technology, HR is confronted with a new "new thing"[23] – a transformation of models, practices, and mindsets.

Second, we accept that there is a dark side to human nature in the workplace in the form of unrelenting competitiveness. People strive to get ahead, aspire to positions of authority, and desire power, with their ambition driving them forward and upward in an assumed career ladder. They vie for attention, visibility in what they do, and seek acknowledgement. While recognition for one's work is part and parcel of today's competitive business culture, it often comes at the expense of work-life balance, collegiality, and professionalism. Must this be so? Can people function and thrive without the acrimony of envy and cut-throat competition? Can't everyone truly win, in their own way?

Third, we embrace the human side of enterprise, the inclusive idea McGregor brought to bear on 'industrial management' – a phrase that though antiquated nevertheless is apposite in describing the current climate of business changes and challenges. Although we have moved out of the industrial era into a globalised new world economy, the essence of management that we must continue to embrace is to incorporate within this new economy the social behavioural sciences – the *art, heart* and *humanity* of HR. To this end, a HR education at SUSS remains founded on three core themes – knowledge of business practices, understanding of human behaviour, and mastery of the domain knowledge of what HR does. A fourth theme undoubtedly is the ethical and moral values that guide us in our dealings with others and which enrich our lives. In keeping with the spirit of the university's mission to provide lifelong education and equip learners to serve society, our programmes will continue to produce graduates who embrace ethical and moral values with an unquestionable sense of humanity in their professionalism.

Concluding Thoughts

The HR landscape is continually changing, and we need to change too, to innovate and to keep abreast and ahead of the curve. What, then, is our promise to the graduates who will leave us and go on to fill jobs of their choosing? Can they realistically find a fulfilling HR career that allows them to contribute not just economic value but also social capital that is

23 Lewis M 1999. The New New Thing: A Silicon Valley Story. New York, NY: WW Norton & Company.

delivered with a humane sense of justice, righteousness, and warmth? Can we envision a future HR career path for them that results in a sense of individual and collective worth? At SUSS, we believe we can. While Dickens likely never intended for his 19th century novel to be used in a HR context, the message remains clear: conventional, traditional HR functions are a thing of the past. The buzzword today is *design thinking*[24] (redesigning the way we work). The future of HR science is embedded in several opportunistic challenges, the least of which involves managing big data, simplifying its processes, and building a culture of collaboration, empowerment, and innovation. As SUSS, we understand these challenges and we embrace its opportunities. We are proud to be able to contribute and to be leading the way in a new landscape for HR professionals.

24 Bersin J 2016. The New Organization: Different by Design (http://joshbersin.com/2016/03/the-new-organization-different-by-design/).

Chapter 18

Fintech Tsunami: Blockchain as the Driver of the 4th Industrial Revolution

David LEE Kuo Chuen

Introduction

When the Internet was first created in the 1990s, no one expected it to have such a great impact. Blockchain is in a similar position today. Basically, the term blockchain refers to the sequential encryption of information. Satoshi Nakamoto (2008) circulated his white paper on it to a group of Cypherpunks.[1] The community was then excited but no one outside knew that it would be so influential. That paper described how a digital currency created by cryptography called bitcoin (using blockchain technology) can transfer value without any central authority.

Although Nakamoto (2008), creator of bitcoin, did not use the word blockchain in his seminal publication, there were a few sentences linked to blockchain.[2] The concept of *Cipher Block Chaining* was first mentioned by Ehrsam, Meyer, Smith and Tuchman (1976). Bitcoin features are very powerful, but their implications are neither fully understood nor revealed yet. Nonetheless, blockchain, as one of its underlying technologies, is now hailed to be the main game changer for the 4th industrial revolution.

The sections to follow in this chapter will discuss Bitcoin as the most popularly-known practical application of blockchain, the role of blockchain in the new digital economy and the characteristics of a sustainable blockchain company; and elaborate on the 4Ds, LASIC principles, Hinternet, and the deep business skills and strategies needed to excel in the blockchain industry.

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1 See https://en.wikipedia.org/wiki/Cypherpunk. A Cypherpunk is any activist advocating widespread use of strong cryptography and privacy-enhancing technologies as a route to social and political change.

2 See http://ethereum.stackexchange.com/questions/4454/who-coined-the-term-block-chain/4455.

a. On Page 3. "As later blocks are chained after it, the work to change the block would include redoing all the blocks after it."

b. On Page 7. "This prevents the sender from preparing a chain of blocks ahead of time by working on it continuously until he is lucky enough to get far enough ahead, then executing the transaction at "that moment.

Bitcoin

After the first bitcoin block was created in early 2009, the world experienced a revolution that few understood. Indeed, without many knowing it, the invention of the resultant Bitcoin network – with a capital B to differentiate it from the small b for the digital currency bitcoin it creates – began a global shift just like the Internet did (Lee 2015a and 2015b). Reaching a current market value of over USD20 billion, Bitcoin has lasted more than 9 years now.

The key reason no entity or person that tried to create a new currency system before was ever successful is that they operated within the system. The Bitcoin network transformed businesses by defining a class of business entities that either has no legal status, or is very difficult to enforce a closure when there is one. Without a collective legal entity status, this particular class of entities now exists in a space outside the jurisdiction of both fiat currencies and legal systems that we know of or operated in.

The reaction of most people when they first heard about bitcoin was almost certainly negative, or with a sense of confusion. There was a misguided perception that bitcoin was used mainly for money laundering, or as payments for drugs and pornography. But most also realised simultaneously that the mathematics, cryptography, system design, and philosophy behind the network were created by a genius or geniuses who understood the imperfections of the global economic and financial system. Naturally, it appealed to those who were losing faith in the fiat system, and to those who believed that existing financial and economic systems were biased and functioned to generate wealth exclusively for the very wealthy.

The major social-economic contribution of bitcoin was the use of a decentralized filing system and peer-to-peer network to redefine a world using only open-source software concurrently run by many users anywhere in the world. The second contribution of bitcoin was the elimination of the need for a middleman for the verification of transactions or records. Previously, centralised activity would require an intermediary to facilitate or verify transactions of goods and services, but this is not required if there are many copies of a public register with timestamps. The third contribution was the removal of known identities. With decentralisation, all you need is a public address and a private key to facilitate any movement of values or digital assets using cryptography. There is no need for personal identity information – a major headache for financial institutions that need to comply with *Know Your Client* regulations.

Digital Economy and the 4Ds

The new digital economy introduces new thinking, particularly the 4Ds (Digitalisation, Disintermediation, Democratisation, and Decentralisation). As incumbents struggle to hang on to what they have and are comfortable with, mindset is more important than skillset. This display of inertia prompted many thought leaders to be forceful in their public speeches, to get the change going. Perhaps the following quotes will demonstrate the thoughts and attitudes towards innovation in a transforming economy:

1. *"It is not the (offline) economy that is in trouble, it is your (offline) business that is in trouble."* – Jack Ma's speech (paraphrased from Chinese) to the business community warning that business change may not be fast enough, against the rise of the Internet and Artificial Intelligence (AI). He sounded the alarm about disappearance of physical stores and businesses with the introduction of e-commerce years ago.

2. *"Failure is an option here. If things are not failing, you are not innovating enough."* – Elon Musk of Tesla, in response to the many who believe in processes rather than outcome in the new economy. The fear of not being able to change has prompted him to conclude that processes are for people who are incapable of changing the mindset of incumbents.

3. "*This is your last chance. After this, there is no turning back. You take the blue pill – the story ends, you wake up in your bed and believe whatever you want to believe. You take the red pill – you stay in Wonderland, and I show you how deep the rabbit hole goes. Remember: all I'm offering is the truth. Nothing more.*" – Morpheus, the prophetic forerunner character in *The Matrix* movie, explaining to saviour-to-be Neo that the Matrix is an illusory world. The two pills are popular culture symbols representing the choice between embracing the sometimes-painful truth of reality (red pill) and the blissful ignorance of illusion (blue pill).

Paradigm Switch in the Production Function

The fourth industrial revolution, evolved from digital innovation, has rewritten the entire production function with emphasis on a different set of factors. In classical economics, the essential factors of production are land, labour and capital. However, the arrival of digital devices, the Internet, and the ability to harness data changed the landscape of the economy and business. The new economy cares more about data, time, and capital-raising ability. Let's examine these factors together.

In the supply chain of e-commerce and online business, land, and geographical location are less important since the computational power server they use occupies a small area and can be located far away in the digital Cloud. Labour can be replaced by data technology that helps to serve customers better than before; and if that is not enough, AI and robots can take over mundane and factory jobs.

Machinery and equipment that workers leverage to produce goods efficiently are capital in the old economy. With the convergence of data technology, computing power, 3D printing, and other software and hardware; and the long (7 or more) years before reaching profitability, the ability to raise funds displaces the acquisition of physical equipment as the new essential for businesses. Good fundraisers, using keen understanding of investment behaviour change, need to entice investments into businesses with long profit droughts in return for exponentially large gains.

There is little point in making distinctions among the 'old economy' primary or secondary factors of production of land, labour, and capital; it is more important to focus on the 'new economy' essential factors of data, time, and the ability to raise funds. This means that any new economy business that is not investing enough in data technology, computing power, and ability to attract new funds will be irrelevant in the future economy.

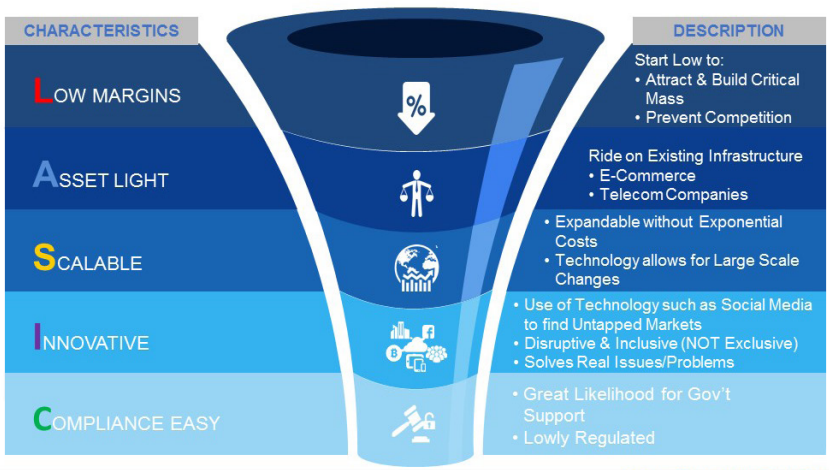
LASIC Principles

As the economy started moving towards a digital-base, with AI, Big Data, Internet of Things (IoT), 3D printing, and blockchain, research studies were conducted to search for factors that are common to successful companies. In their studies, Lee and Teo (2015) explore the characteristics of successful companies such as Ant Financial, M-PESA and Fidor Bank. Ant Financial's Alipay has close to 500 million mobile users, and both M-PESA and Fidor Bank have grown substantially in a short time. All three companies exhibit the LASIC (Low Margin, Asset Light, Scalable, Innovative, and Compliance Easy) characteristics (see Figure 1).

Attracting critical mass with low margin and preventing competition from others are essential for these online businesses. The companies that incur substantial capital expenditure tend to have high depreciation cost. However, riding instead on existing infrastructure such as the Internet, E-commerce platforms and telecom facilities allows them to operate with a light balance sheet. As a result, these companies can scale without exponential costs and with existing technology expanded easily to meet changing demand from adopters. At the same time, their business models are innovative in searching

for underserved and untapped markets with disruptive, yet inclusive technology to address pain points of customers. Finally, most of them operate in a compliance friendly environment with government support and are almost unregulated in some areas of business.

Figure 1. LASIC Principles



"Emergence of Fintech and the LASIC Principles", with Ernie Teo, Journal of Financial Perspective, 2015, Vol 3, 3. http://www.ey.com/Publication/vwLUAssets/ey-the-journal-of-financial-perspectives-fintech-winter-2015/$FILE/ey-the-journal-of-financial-perspectives-fintech-winter-2015.pdf

In discussing these models that conform to the LASIC principles, researchers point out that to build a Hinternet, decentralisation is not a necessary condition. A Hinternet is a virtual or digital space with a large population of sticky customers such as Alibaba's e-commerce platform on the Internet. Alipay and Grab have large LASIC Hinternets that ensure they can sell a wide range of products to the sticky customers (Lee 2016; Lee & Dula 2016). Blockchain is not needed for building a Hinternet business, but for sustained growth, the last D, i.e., decentralisation, is needed and thus may involve blockchains.

Decentralisation builds a higher barrier so that monopoly and oligopoly market structures will not take shape easily. A Hinternet that has grown too large in size may create systematic risk and thus attract regulation to break it up. With decentralisation, regulation may play a smaller part but the purpose of the democratisation of information, technology, and services is achieved. Price discovery in a decentralised environment is an important issue but beyond the scope of this paper.

Satoshism

The timing of the release of the Nakamoto (2008) paper coincided with the global financial crisis. While the actual identity of Satoshi Nakamoto is not known, Satoshism that embraces decentralised sharing of immutable data, P2P consensus algorithm, and anonymous access has many followers. The main reasons stem from the imperfection of the existing financial architecture:

1. Lack of Transparency. Transaction details and fees were opaque, with high costs for cross border transactions.

2. Lack of Resilience. Fears of potential business discontinuities by single points of attack, and the perceived lack of protection of historical record.

3. Lack of Distribution of Wealth. Lack of decentralised and super-divisible money – the smallest unit of bitcoin is 10^{-8} BTC or 1 Satoshi but theoretically, higher precision is possible – that catered to the bottom of the pyramid. There was also no suitable technology to distribute wealth and assets more evenly over time with more than 70% of the people being excluded from the financial and economic system.

4. Lack of Individual Control of Privacy. No control over encrypted personal data.

The philosophy of Satoshi is however not without its weaknesses. First, a decentralised network is less efficient than a centralised one. In terms of transaction per second and latency, a centralised network can be organised more efficiently. With Proof of Work that is not only computationally expensive, it is also environmentally unfriendly. With blockchain, storage of data is an issue and each individual block size is a point of contention. Storing multiple copies is far from being space efficient.

Second, there is a lack of privacy because the public ledger records all transactions. And third, there is a lack of further guidance from Satoshi as he has faded into the background with the community testing the boundaries of his creation. The issue of first mover advantage in ownership (No Expiry Date of Ownership) is an issue for those who believe in intergeneration equity. Bitcoin technology can be hijacked to rule society rather than serve it by convincing the majority of the users to focus on profit motives and self-interest rather than the community's interests.

Blockchain Essentials

A good blockchain should possess the following qualities:

1. LASIC principles
2. Resilience
3. Transparency of transactions
4. Personal control of privacy
5. Enabler for 4Ds
6. Enabler for collaboration of untrusted parties globally
7. Enabler for asset ownership sharing globally

Despite the hype about blockchain since 2015, it is just a new form of database, the special kind that allows shared ownership across organisational boundaries. There are two types of blockchains: Private and Public. The differences between them are tabulated in the Figure 2 below. Both types are similar in design, but worlds apart in use cases (Lee & Ding 2017; Lai & Lee 2017). Whereas in contrast, the differences between Private Blockchains and Databases (see Figure 3) are similar in use cases, but worlds apart in design.

Blockchain is a form of distributed ledger with specific distinguishing features that other distributed ledgers may not have. In particular, the decision to have a blockchain is usually engendered by a certain degree of distrust among nodes users. Another critical push-factor is the requirement for transparency for the entire or part of the ledgers. Finally, blockchains are useful if there is a need to ensure that past records are almost permanent with every node, or made available to every node. Without the need for improvement of trust and transparency, it may well be more efficient to use a distributed or centralised ledger.

Figure 2. Comparing Private and Public Blockchains

Conditions	Private Blockchain	Public Blockchain
Centralisation /Purpose	Semi-decentralised Business-to-business	Decentralised Peer-to-Peer
Authentication	Authenticated	Not-authenticated
Permissions	Permissioned	Permission-less
Advantages	• Support legal entities • Higher performance • Better scalability	• Support anonymity • Higher immutability • Trustless environment

Figure 3. Comparing Private Blockchains and Databases

Conditions	Private Blockchain	Traditional Database
Ownership	Designed for shared ownership	Not designed for shared ownership
Performance	Slower	Faster
Scalability	Easier and cheaper	Harder and expensive
Immutability	Append-only	Editable

There is a class of very powerful blockchains that records and transfers tokens with value. This special feature allows blockchain to create tokens in the form of transferable "currency" or "stake", just like national currencies and shares in the fiat currency world.

Digital Asset Ownership

The most powerful feature of blockchain is to allow for shared ownership of assets or rights. There has been a great interest in Initial Coin Offerings (ICO), sometimes known as Initial CryptoToken Offerings (see Figure 4) and basically an Initial Token Sales (ITS). ICO may sound like IPO (Initial Public Offering), but it has a totally different structure and almost no legal recourse.

Figure 4. ICO Status Statistics[3]

ICOs Status	Number
Past	139
Ongoing	13
Upcoming	57
Total	211

3 Data extracted from:
https://cyber.fund/radar
http://Icocountdown.com
https://www.ico-list.com
http://iof.hexun.com/2016-07-25/185142280.html
https://en.wikipedia.org/wiki/List_of_highest_funded_crowdfunding_projects
http://icorating.com
https://tokenmarket.net/ico-calendar
https://coinmarketcap.com/assets/maidsafecoin/#charts
http://digitalmoneytimes.com/equinoxcoin-turns-into-a-scam-after-bittrex-ico-despite-coinssource-rating/
https://safenetwork.wiki/en/FAQ

The Top 10 ITSs (see Figure 5) are successful in that they have raised a substantial amount of proceeds in the form of Cryptocurrency in exchange for the Tokens being sold. For an ITS to be successful, the founders or project must have an Online Identity, with a good Standing in the Community, issue a technical and other Whitepapers, publish its Technology and Source Codes, conduct a Pre-Sales with clear Reward/Incentives Structure, transparent with its Use of Proceeds and Valuation, Outline the Governance Structure, and engage prominent Advisors and Governors.

Figure 5. Top 10 ITS (as at 15 April 2017)[3]

Name	Amount (USD)
ETHEREUM	18,439,086
COSMOS	16,800,000
WAVES	16,436,095
QTUM	15,664,829
GOLEM	8,600,000
FIRSTBLOOD	6,267,767
LISK	6,150,000
DIGIXDAO	5,500,000
AUGUR	5,133,000
Total	98,990,778
DAO	150,000,000
Total	248,990,778

Unlike shareholding in an IPO, an ITS must specify role of the tokens being sold. In general, there are three possible roles: user, commodity and debt. These roles can be summarised as follows:

1. User Tokens (App Coins or Protocol Tokens). Access services provided by the distributed network.
2. Commodity Tokens. Finance development of the network.
3. Debt Tokens. 'Short term loan' to the network, in exchange for interest payments on the amount.

The Token software can create user; commodity; debt; user and commodity combination; or user, commodity, and debt combination tokens. However unlike shares, these tokens may 1) have no voting rights, 2) have cash-flow distribution pre-determined by algorithms, 3) have no legal rights and recourse, 4) have no group decisions rights, 5) have no shares and debts, 6) have no avenues to remove the management, and 7) be building user base, investor base or both. We can summarise token rights as Payments, Access, Profit for Fees, Contribution, Block Creation, and Governance. More than half of the tokens issued have payments and access rights (discussed in Lee 2016).

Hybrid Legal or Crypto Structure

Under the Howey four-pronged test of US Security Regulation, an instrument is a security if it 1) involves an investment of money or other tangible or definable consideration used in, 2) a common enterprise with, 3) a reasonable expectation of profits to be, and 4) derived primarily from the entrepreneurial or managerial efforts of others. If a token falls under the definition of security, then security laws and regulation will apply. So, there are good reasons to approach ITS with care so that there is no violation of law and regulation. Another US legal question is to determine if a Blockchain is a transfer agent. If it is, a license is required under the law SEC (1946).

In countries where tokens are not securities, there are four models that have been used to launch an ITS:

1. Award of Contract. A legal entity (e.g., Pte Ltd) awarded a contract by a client (blockchain) to write the code for the blockchain, and subsequently have an ICO of the resulting blockchain with tokens.

2. Commodity Sales. A foundation (e.g., Swiss GmbH-LLC) initiates a sale of a commodity (fuel/token) required to run the blockchain on an open source platform.

3. CODE. Centralized Organized (CO) legal entity spends the tokens collected from the Decentralized Entity (DE) blockchain ICO and the CO also collects the revenue generated, for example, after the project of building an app.

4. Plain Vanilla Token Allocation. Tokens are first mined by allocators and allocated via a computer algorithm that does not specify any specific public addresses to receive funds.

Is ITS & DAO Structure All Bad?

Lior Zysman (2017) argued that ITS has perhaps brought many benefits to the community:

1. Flows of funds are recorded real-time on an open blockchain.

2. The new JOBS Act Title 3, which opens investment in startups to individuals, requires startups to publish financials once a year; in contrast, blockchain accounting guarantees their investors financial reporting all year long. The Act also requires businesses to publish a business plan once a year. In contrast, some ITSs are powered by transparent open-source codes that any machine on a distributed network can run.

3. Funds that the ITS directs are also published on the blockchain, and the by-laws themselves that determine the relationship between the ICO participants are embedded in the code.

4. The execution of those bylaws and ITS' accounting do not depend on familiar figures, like the CEO or an auditor, although the status of humans on the edges of the network or curators has never been debated in case law and might be replaced using formal verification methods.

Zysman contends that, perhaps for the first time in corporate history, investor expectations – a big concern for lawmakers and regulators – are being directly met by the ITS code. Communication is key in selling the token, transparency is essential with no over-promising of product goals or return on investment. It is best to emphasise that these are experiments and to ensure there is awareness of the fiduciary duties.

There are many ICO Scams! So buyers beware. ICOs rank high in terms of Risk and Complexity Classification, indicating there is a high uncertainty of outcome. As such, these tokens are not suitable for widows and orphans, speculators, traditional fund managers, and sophisticated investors. Given that it is an experiment and suited for a learning portfolio that may have zero rate of return, the participants should be from the community of blockchain, mentors, and angel investors.

Concluding Remarks

Blockchain is not needed in many use cases where database will do. For sustainability and network effect, blockchain must scale to serve the underserved. It will scale faster if it is open, engages AI, Big Data, and IoT.

We need to watch and plug into China, which has mastered the skills of scaling, financial inclusion, and user experience. The business strategies of combining economies of scales and economies of scope in Fintech will spill over to blockchain in China with emphasis on financial inclusion and green finance. China will dominate the blockchain industry because of its size and capital expenditure on research and development.

Unlike company shares that give voting rights and a share of the profits, Crypto Tokens are just an entitlement to rights. These are rights to facilitate P2P payments, rights to access and use a network, rights to share the profits from a crypto cash-flow business model, rights to contribute to a network for charity or other activities, rights to create a new blockchain or a block of data, and the right to participate in governance activities. ITS/ICO is a new way to raise global funds in a crypto economy. ITS's or ICOs are for those interested in the technology and its associated experiments. An online identity with community spirit, a good understanding of fiduciary duties, transparent communication, under-promise in technology goals, no promise of ROI, and assisting communities to serve the underserved are key success factors.

It should be emphasised that the most powerful feature of blockchain is the sharing of asset ownership, which takes place in a centralised environment that lacks full trust and is in need of democratisation of information, technology, services, as well as micro ownership. Blockchain will be the main driver of the fourth industrial revolution as it enhances not only the productivity of the system, but harnesses the talents of an open and inclusive community. There is a lack of neither capital nor good technology, but no amount of capital or technology can do what blockchain does so well: providing powerful crowdsourcing and harnessing features that enhance collaboration and enable parties that distrust each other to work together effectively in a decentralised and innovative environment.

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Chapter 19

Developing a Student Success Ecosystem for Online Learning in Higher Education

Tina STAVREDES

Introduction

Strategic vision requires the ability to identify trends which are not temporary but have sustaining impact. The Singapore University of Social Sciences (SUSS) has the foresight to see the future educational landscape of Singapore and made the commitment to online learning as a strategic initiative to support lifelong learning. Through the use of technology in teaching and learning, online learning can enable individuals within and outside Singapore to access a quality education, anytime, anywhere. Online learning provides a path for individuals seeking to continuously learn and acquire important skills and competencies as they progress in their career or develop new career paths.

Driven by economic growth and the demand for a knowledge-based economy, Asia is experiencing significant growth in the number of students seeking higher education. However, many countries in the region are unable to meet the expected demand for further education and are searching for solutions to bridge the supply-demand imbalance. A consequence is the outflow of students seeking higher education outside of their home countries. According to data[1] from the Organisation for Economic Co-operation and Development (OECD), Asian students accounted for 53% of all students worldwide enrolled in higher education institutions overseas. Traditionally, the flow of students has been towards English-speaking countries, such as the United Kingdom, United States, and Australia.

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1 UNESCO 2007. Global Education Digest 2007: Comparing Education Statistics Across the World. Montreal, Canada, UIS.

As an English-speaking country known for its quality education system and its reputation as a regional education hub, there is good opportunity for Singapore to attract this outflow of Asian students to our universities.

Online degree programmes in particular have considerably more potential for student inflows as there is no associated physical campus capacity constraint. Online learning has become a relevant way to learn around the world because it offers learners the ability to seek a degree while still balancing work, family, and other obligations. However, student retention in online programmes is a major problem. Research shows that dropout rates for online students typically run 20% to 30% higher than students in programmes on ground campuses. In Asian countries retention rates have been reported as high as 50%.[2] The "Pathways to Prosperity" study[3] by the Harvard Graduate School of Education shows that 55% of college students failed to complete their four-year degrees within 6 years. Of those who start two-year degrees, 71% failed to finish them within 3 years. Additionally, 78% of students at career and technical colleges fail to earn a degree after 6 years.

According to the Harvard study, students drop out for many reasons, including under-preparation for the required academic work, financial pressures, and competing priorities of family and jobs. Similarly in a study at the UK Open University, Ashby[4] (2004) found the most common reasons for withdrawing from an online course included students falling behind in coursework (43%), general personal and family responsibilities (37%), and employment responsibilities (30%). What can be done to help prevent students from dropping out of their online studies? What then is the secret to success in online learning expansion and growth? These are clearly important questions to consider.

Educational institutions are morally obliged to help students succeed in their studies and thus must take the lead in addressing the online programme challenges raised. The logical responding assertion is that the success of online learning initiatives hinges on the ability of these institutions to develop the required ecosystem to ensure each student can achieve his or her educational goals.

This chapter is written to elaborate on the features of this ecosystem. The chapter will first provide an introduction into the broad principles of the prescribed ecosystem in the next section, and then deeper details of each main element in subsequent sections.

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2 Pierrakeas C, Xenos M, Panagiotakopoulos C & Vergidis D 2004. A comparative study of dropout rates and causes for two different distance education courses. The International Review of Research in Open and Distance Learning 5(2) (http://www.irrodl.org/index.php/irrodl/article/view/183/265).

3 Symonds WC, Schwartz RB & Ferguson R 2011. Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century. Report issued by the Pathways to Prosperity Project, February, Harvard Graduate School of Education.

4 Ashby A 2004. Monitoring Student Retention in the Open University: Definition, Measurement, Interpretation and Action. Open Learning 19(1):67-77.

Student Success Ecosystem

The essence of a *Student Success Ecosystem* must be to replicate useful elements of conventional campus-based educational programmes, mitigate the weak characteristics of online programmes, and leverage advantages offered by the intensity of technology applied in online studies. The ecosystem should comprise structures, processes, and procedures that support online learners throughout their educational lifecycle. Catering to students studying on campus, and online locally and abroad, the characteristics of this ecosystem must be agility and adaptability, and yet cause minimal disruption to conventional campus operations and staff.

From admission to graduation, each aspect is designed to help students persist and meet the expected outcomes of their online study programme. The operative word is "persist". Though online students are given more time to complete their programme, they have far more matters that distract and disrupt their studies to deal with. The scope of the ecosystem must therefore includes ways to enrich their online learning experience, and prevent and relieve possible emotional, financial, and time pressures that arise from time to time.

According to Crawley,[5] a positive student experience depends primarily on the quality of interactions students have with an institution. Many higher education institutions have developed administrative silos, which can create tensions between departments, and this often results in students receiving conflicting messages on how to solve their educational issues. This is particularly pronounced for students who have few face-to-face options to resolve these issues.

Newberry and DeLuca[6] describe the importance of developing a partnership between an institution and the online student that spans the student's academic lifespan. To support student success, an institution needs to make every interaction with online students customised, supportive and personable. The student success ecosystem should also nurture a sense of belonging for the online student, create connections between them and the university's academic and administrative staff, and provide the appropriate support networks to help students develop goals and shape realistic expectations.[7] Students must not feel that they are alone in their struggles, and that fellow students, both peers and seniors, and designated university staff are accessible for best practice advice and general guidance.

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5 Crawley A 2012. Supporting Online Student: A Guide to Planning, Implementing and Evaluating Services. San Francisco: Jossey-Bass.

6 Newberry R & DeLuca C 2014. Building a Foundation for Success through Student Services for Online Learners. Journal of Asynchronous Learning Networks 17(4), February.

7 Akey T 2006. School Context, Student Attitudes and Behavior, and Academic Achievement: An Exploratory Analysis. William T. Grant Foundation and the Bill & Melinda Gates Foundation.

Enrolment and Admissions

Student success starts with understanding the type of learner who is best fit to learn in an online environment.[8] It is essential to understand the identity traits shared by successful online students so that institutions can effectively market their academic study programmes and recruit the right students. Online learning requires students to be self-directed and independent learners. It also requires learners to have strong academic skills to learn in a more independent study environment. Once there is an understanding of the "fit" of a potential student for online learning, then it is important to screen each new student for their level of academic preparedness and create an appropriate success plan to help them persist to achieve their educational goals.

During the enrolment process, it is important for enrolment counsellors to help students set realistic expectations of online learning, to understand the commitment and the self-directedness required of them to successfully complete their online programmes. It is unrealistic to present online learning as being easy, only to have students struggling to cope with the demands of their programmes after enrolment.

Most institutions that offer online courses provide some type of orientation for online learners. However, orientation attendance is often not mandatory and busy students do not take the time to go through the orientation. This creates more work for instructors to help students access their courses and navigate the online course environment in the first week of class. It may also result in students not having the right computer equipment, browsers, and application software needed to complete course activities. An end result of being unprepared for online learning can be the student dropping out in the first few weeks of the course due to frustration.[9]

Online students should attend mandatory orientation to the institution, the online learning environment, and essential policies, procedures, and access to support resources[10] to ensure they have the required information and skills to be successful online. A virtual orientation can provide students with information and resources to help them successfully navigate an online programme of study.

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8 Bowman NA & Denson N 2014. A Missing Piece of the Departure Puzzle: Student Institution Fit and Intent to Persist. Research in Higher Education 55(2):123-142.

9 Bowman L & Conway G 2002. Communication in Online Learning Environments: Framing Asynchronous Online Discussions (July/August). Retrieved March 1, 2006, from Society for Applied Learning Technology (http://www.salt.org/salt.asp?pn=procabs&ss=l&key=32378).

10 Niu S & Tienda M 2013. High School Economic Composition and College Persistence. Research in Higher Education 54(1).

Student Services

During the enrolment process, many students develop strong relationships with their enrolment counsellor, so a smooth hand-off from admissions to the academic team and student services is needed. Smith[11] suggests three key objectives to building effective and efficient online student services: *"identify the needs of its online learners; make services available when the learner wants them, rather than when the school is comfortable providing them; and provide online services that are as good as or better than face-to-face equivalents"* (p29). An online student service model must reflect a new way of engaging with students that enhances traditional advising with a coaching component.

Coaching can help students overcome roadblocks as they try to successfully integrate their online studies with their current life and responsibilities.[12] A personal 'success coach' can provide a more personalised support for online students, when they experience issues with their online programmes, or even when they just need a listening ear. This online success coach model will demand the use of highly qualified support staff that can work with individual students throughout their educational journey. These coaches should know their students personally and academically, and are able to advocate for these students and help them persevere in their studies. Part of the success coach's role would be in providing emotional and psychological support to the online student.

For online learners, one of the most dynamic forces at play would be an emotional one. The feeling of isolation can become overwhelming in an online environment and knowing that they have someone who cares about how hard they are working to achieve their educational goals is important. When a student begins to struggle with his or her studies and contemplates dropping out, the success coach needs to be there to reassure them of their capabilities and remind them they are good enough, smart enough, and capable of overcoming barriers to their educational success.

Student services needs to adopt a proactive approach in student support, rather than intervening only when students are at risk or close to dropping out. Continuous monitoring of student attendance and performance is important, along with proactive outreach to provide timely and substantial support to help students overcome obstacles, whether real and imagined.

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11 Smith B 2005. Online Student Support Services. Community College Journal 76(2).

12 Bettinger EP & Baker R 2014. The Effects of Student Coaching: An Evaluation of a Randomized Experiment in Student Advising. Educational Evaluation and Policy Analysis 36(1): 3-19.

Instructor-Student Relationship

An online student's relationship with his course instructor is crucial to student success. Retention may improve if instructors express their sincere belief that all students are capable of learning and can be taught to learn.[13] Online instructors need to communicate regularly with students and provide encouragement and create opportunities to help them persist. One of the critical factors to student success is the amount and type of feedback that instructors provide to their online students. In addition, the feedback should be timely, specific and actionable, so students can appropriately respond to the feedback to improve their week-to-week performance.

Bork and Rucks-Ahidiana[14] describe discrepancies between students and instructors in relation to expectations, roles, and responsibilities, which can lead to misunderstandings. Therefore, it is important to discuss instructor expectations at the beginning of each course. An expectation statement posted to students in a course can be used to communicate to students specific policies and procedures. These can include requirements for attendance, late submission of assignments, discussion interaction, etiquette rules, assignment grading turnaround time, and the manner that the instructor will interact with students in the course, just to name a few.[15]

Instructional support should scaffold learning from both a cognitive and psychology perspective, to ensure students have the needed support to persist in learning. Types of scaffolding includes procedural, metacognitive, conceptual, and strategic.[16] Procedural scaffolding supports the student in being able to navigate the online environment and complete study activities. Within the virtual classroom environment, it is important to consider ways to scaffold the students' metacognitive strategies to help them plan, monitor and evaluate their learning. Calendars can keep students on track with specific due-dates for graded activities. Worksheets and checklists for different learning activities can provide appropriate tools to help students monitor their planning and completion of specific activities.

Grading rubrics are a vital tool to help students evaluate their performance while reflective activities support students' continuous improvements. Conceptual scaffolding can support their understanding of major concepts through the use of graphs, concept maps, and

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13 Lotkowski VA, Robbins SB & Noeth RJ 2014. Factors in Improving College Retention. ACT Policy Report (www.act.org/research/policy/index.html).

14 Bork RH & Rucks-Ahidiana Z 2013. Role Ambiguity in Online Courses: An Analysis of Student and Instructor Expectations (CCRC Working Paper No. 64). New York, NY: Columbia University, Teachers College, Community College Research Center.

15 Stavredes TM 2011. Effective Online Teaching: Foundations and Strategies for Student Success. Jossey-Bass a Wiley Imprint.

16 Stavredes TM 2011.

organisational charts to name a few. Finally, strategic scaffolds can support students' individual needs by providing personalised feedback based on individual student performance.

Online Pedagogy

Online learning provides a gateway for students to choose an online programme that meets their individual learning needs from anywhere in the world. For most students, this includes a curriculum and pedagogy that provides practical, real-world knowledge and skills they can apply immediately. With an expanded competition for students, an institution's online learning model must foster an authentic learning experience, and support students in developing a real-world understanding of how knowledge is applied to solve problems. To achieve this, online students should be engaged as active contributors of knowledge through the understanding of problems from their own perspectives and considering the perspectives of their peers; thereby, providing a rich multicultural understanding of the world around them.

There is therefore a need to consider deeper learning approaches where students master the skills of critical thinking, problem-solving, and self-directed learning. Online learning should provide a direct means of collaborative learning that can support a model of improving student engagement and knowledge construction through an openness to diversity, and exposing students to the multiple perspectives of their peers from different demographics. Project-based or case-based learning can be options to support active learning to help students engage in thought-provoking studies and discussions that are situated in diverse real-world scenarios.

Technologies continue to evolve to support deep, rich learning online. It is therefore essential to keep abreast of what is available, and to select intelligently and decisively what should be implemented. The New Media Consortium provides a yearly report on current trends in technologies for learning. The 2017 report[17] discusses technology developments that have the potential to foster real changes in education, particularly in the development of progressive pedagogies and learning strategies, organisation of teachers' work, and arrangement and delivery of content. Two technologies of importance to online learning are adaptive learning and mobile learning.

17 Adams Becker S, Cummins M, Davis A, Freeman A, Hall Giesinger C, & Ananthanarayanan V 2017. NMC Horizon Report: 2017 Higher Education Edition. Austin, Texas: The New Media Consortium.

Adaptive learning refers to technologies that monitor students' progress and uses data to modify timely instructions to send to students.[18] Adaptive learning allows the dynamic adjustment of content based on individual skills, knowledge, and ability. This provides a more personalised student learning experience, such as giving additional content to fill gaps in understanding, and introducing more complex content to accelerate performance for students with advanced competencies. Because adaptive learning technologies adjust content in real time, online students are able to progress in their learning without direct intervention from their instructor. It provides them just-in-time support, rather than having to wait until their instructor is available for interaction.

In addition, adaptive technologies collect data on the content students engage with, along with performance data to help instructors determine strategic scaffolding strategies to support individualised learning. The end goal of adaptive learning is to *"accurately and logically move students through a learning path, empowering active learning, targeting at-risk student populations, and assessing factors affecting completion and student success"* (p38).[19] Publishers are also looking at the new needs of students and investing in adaptive technologies and simulations, as well as ldeveloping instructional design teams to support institutions as they develop online curricula that can compete in the global online learning market.

Online learning can use mobile learning to foster deeper learning approaches by creating new opportunities for students to connect with course content.[20] Mobile learning is pervasive and changing the way people interact with content and their surroundings. It supports the concept of anytime, anywhere learning because it enables students to access course materials, engage with academic and support staff, and demonstrate learning achievement through different mobile ready apps. Mobile apps allow for two-way, real-time communication, helping educators efficiently respond to student needs.

A study of a South Korean online university found that learners with full-time jobs were 48% more likely to use a mobile LMS than non-working students.[21] Researchers posited that the flexibility afforded by on-the-go access to learning materials helped working students better integrate academics into their daily schedules. Students can also use mobiles to practise 21st century skills including communication, collaboration, and content creation. Effective deployment of mobile technology entails careful planning and thorough initial evaluation of the learning context.[22]

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18 Adams et al 2017.
19 Adams et al 2017.
20 Adams et al 2017.
21 Adams et al 2017.
22 Adams et al 2017.

Many of the universities which have been at the forefront of online learning are continuing to evolve their online pedagogy to meet the changing needs of students. They have invested heavily in adaptive learning technologies and mobile ready learning applications, and are expanding their instructional design teams to build an array of flexible pathways to degrees. To meet the dynamic demand of the market, an institution embarking to expand its online programmes cannot just try to move with the flow, but should instead develop a clear market-driven strategic plan for developing and evolving its online curricula and pedagogy.

Student Behaviour

To support student success and persistence, there must be a clear underlying understanding of student behaviour. Student behaviour has a profound impact on students' ability to persist in the challenging online learning environment. The ecosystem should plan to provide support to maintain good student behaviour as they work toward graduation. The Fogg Behaviour Model[23] illustrates that three elements must converge for a behaviour to occur: motivation, ability, and trigger. That is, when a behaviour does not occur, at least one of those three elements is missing. With sufficient motivation and ability, then the focus would be on finding a trigger to enable the person to perform the target behaviour. If the person has too low motivation and ability, then having the right trigger will not lead to the targeted behaviour.[24]

Motivation issues may be due to a number of factors including poor self-efficacy, emotional issues, boredom or disinterest. Students with poor self-efficacy, i.e., lacking of belief in one's ability to succeed in accomplishing the tasks, may avoid these challenging tasks out of fear of failure. They may believe that difficult tasks and situations are beyond their capabilities, or be fixated by personal failings and negative outcomes. Emotional issues may occur when students are overwhelmed by academic work or demands of their personal life. Conversely, boredom may result when students do not feel compelled to engage in the online course, which may be due to lack of interest in the subject matter or in learning altogether.

Students may experience ability challenges with learning online. These challenges may arise from time pressures, learning issues, or not having an appropriate routine and schedule to accommodate online learning in their already busy life. Time pressures may be due to poor time management, too many obligations, or childcare and work issues

23 Fogg BJ 2012. A Behavior Model for Persuasive Design (http://bjfogg.com/fbm_files/page4_1.pdf).
24 Fogg BJ 2012.

that take time away from the student's studies. Students may have learning issues that are a result of being distracted, not having developed strong academic skills, or difficulty in learning specific subject matter. In addition, students may be faced with a learning disability or may have difficulties due to English being their second language. A student who lacks an appropriate routine or has not developed the discipline to put aside other competing activities to do their studies will have low ability to successfully complete the required learning activities. Each of these motivational and ability challenges need to be addressed by the institution. Identifying the level of motivation and ability of students experiencing learning issues will help the institution design appropriate communication triggers to help change student behaviour.

Fogg[25] describes three types of triggers: signals, sparks, and facilitators. Signals are used with high motivation, high ability students. The signal trigger does not seek to motivate students or simplify the task; it simply serves as a reminder. Signals can be text messages reminding students of important due dates. A spark is a trigger for students with low motivation, as it motivates the person to perform the required behaviour. An effective spark focuses on the source of low motivation. Sparks can be a motivational story of student success, or other types of inspirational messages. Facilitator triggers are used with high motivation, low ability students. Facilitator triggers can include calendars to help students organise learning activities, hints on quizzes, and assignment examples to help students understand expectations. An effective facilitator builds confidence in the student that he or she can perform the behaviour, and that it will not require a resource he or she does not have at the moment.[26]

Every online learning institution should have a specific intervention plan to support student behaviour change. It is important to ensure that the interventions are understood across the organisation and relevant to the specific needs of students. Interventions should be well-timed, proactive, and developmental, using appropriate delivery mechanisms. And, each chosen intervention should be monitored to determine its effectiveness, as well as to devise appropriate modifications to further enhance it.[27]

Student Relationships

The student success ecosystem should have a strategic plan to manage student relationships and organise engagements with students over the lifetime with the institution. These engagements include all forms of interactions, communications, activities, and events that

25 Fogg BJ 2012.

26 Fogg BJ 2012.

27 Thomas L & Hill M 2013. What Works? Student Retention and Success. December (https://www.heacademy.ac.uk/system/files/downloads/srs_briefing_report_december_2013.pdf).

create, maintain, and deepen the social, academic and cultural bonds among students and between students and staff.[28] Customer Relationship Management (CRM) software can provide the institution with a tool that gives a 360 degree view of the student, which can drive faster service, consistent communication and resolution of issues for the student. It also provides a central repository for reporting student issues, so students do not have to repeatedly describe any issue when they engage different university departments.

CRM technology has a workflow feature, so that issues can be assigned to a department or person if needed, issues automatically escalated, and reminders automatically sent to designated staff, to ensure no issue is lost or forgotten. CRM may include a self-service module to provide an easy way for students to "do things" with the institution, such as scheduling classes, dropping classes, changing study programmes, etc. Creating a self-service environment in which students can choose appropriate tasks and access necessary information provides them with a convenient and central way to address specific issues. Strategically, managing student relationships can result in students getting information and resolving issues quickly and efficiently, which in turn can lead to higher student satisfaction and improved persistence.

Data Analytics

Online learning requires a proactive approach to create the conditions that promote student persistence and success. Proaction is only possible if the institution and its staff know objectively what is really happening in the programmes and with students. The use of data analytics is thus crucial. Good data management must be in place to ensure the right type of data is collected at the right time to develop a rich profile of the online student.[29] In traditional ground-based campuses, student services do not take a proactive role in monitoring and reaching out to students who are not attending classes.

However, due to the high attrition of online students, many of the universities whose majority of students are online, have developed procedures to monitor student attendance and to reach out to students who have been absent for more than a week. By initiating action to contact students before they get too far behind, there is a greater opportunity to help them resolve early any issues they may be having, when there is still enough time to get them back on track. Attendance data should be collected, reported, and acted on weekly. Student services is the appropriate department to disseminate the data and from them, success coaches can reach out to students who did not login their online class during a week.

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28 Chambers D & Paull A 2008. Landscape Study of Student Lifecycle Relationship Management. JISC Organisational Support Committee. August. (http://www.webarchive.org.uk/wayback/archive/20140615045706/http://www.jisc.ac.uk/media/documents/programmes/jos/slrm_report.pdf).

29 Thomas L & Hill M 2013.

Course grades are another set of actionable data. Faculty should be held accountable for students who are failing courses due to their assignments performance. They should be required to personally phone students to discuss their performance and provide appropriate resources to help them overcome specific performance issues that the individual student is experiencing. Student course grades should be monitored by administration on a term-by-term basis, to ensure the curriculum is successful in achieving the prescribed learning outcomes.

At the end of each term, faculty and students should be provided with an opportunity to offer feedback on courses. This creates a culture of continuous quality improvement. Progamme managers can review the end-of-course evaluation survey data collected to find ways to improve the learning experience. In addition, analytics can be used to deliver early indicators of risks so that efficient and effective interventions can be introduced to increase student success, persistence and graduation rates.[30]

Conclusion

By considering online learning as an ecosystem of interacting parts that are structured to function as a dynamic system, an education institution can strategically align structures, processes, and procedures in a seamless and dynamic way to support student success online. The institution must also focus its efforts on supporting students' academic and social integration by providing an environment for a diverse student population to reach their greatest potential through inspiration, engagement, involvement, integration, and support. It is important to remember that a "sense of belonging" is critical to online student retention and success. The human side of higher education must come first – finding friends, feeling confident, and above all, being part of a caring and supportive community.

30 Bischsel J 2012. Analytics in Higher Education: Benefits, Barriers, Progress, and Recommendations (Research Report). Louisville, O: EDUCAUSE Center for Applied Research, August (http://www.educause.edu/ecar).

Chapter 20

Learning (and Other) Analytics in Higher Education

KOH Hian Chye

Introduction

Learning analytics is a relatively new field, having emerged only in the last decade (see Bienkowski *et al* 2012 for an excellent review of learning analytics). It focuses on technology-enhanced learning and has been associated with terms such as educational data mining and academic analytics. It also draws from various other fields such as education, technology and the social sciences. Incorporating both data-driven, and social- and pedagogically-driven approaches, Siemens (2010) has defined learning analytics as *"the use of intelligent data, learner-produced data, and analysis models to discover information and social connections, and to predict and advise on learning.*" From a similar perspective, the First International Conference on Learning Analytics and Knowledge (LAK 2011) defined learning analytics as *"the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environment in which it occurs.*"

Although not identical in meaning, learning analytics and educational data mining are frequently used interchangeably. Ferguson (2012) differentiated them as follows: learning analytics focuses on how to optimise opportunities for learning (education-focused), while educational data mining focuses on how to extract value from learning-related data (technology-focused). Learning analytics and education data mining can be viewed as two sides of the same coin. They share common objectives, with educational data mining focusing on the process of data analysis and learning analytics on the application of the

outcomes from data analysis. In this chapter, for the ease of reference, the term "learning analytics" is used to include both focuses, since they can be deemed respectively as early and late stages of the same process.

In tandem with the rise of learning analytics is the increasing importance of the scholarship of teaching and learning (SoTL) as a research domain that enhances student learning experience (Koh & Chong 2014). As suggested by Van Barneveld *et al* (2012), SoTL *"is the key transformative piece and at the heart of academic analytics"*. In addition, *"analytics can supplement the established theory and practice of the field"* and *"iteratively feed back into SoTL, informing future directions"*. While SoTL focuses on theory, pedagogy and student learning research, learning analytics operationalises them. SoTL and learning analytics complement each other.

Drivers of Learning Analytics

Ferguson (2012) identified technology, pedagogy, and politics/economics as the three major drivers behind the emergence and development of learning analytics. Firstly, educational institutions have been producing increasingly large sets of data from their systems – including interaction data, personal data, systems information and academic information (Romero *et al* 2008). Learning analytics provides the means to extract information from the learning-related "big data".

Secondly, online learning – especially in the form of Massive Open Online Courses or MOOCs – has become in the last decade more pervasive. Under the MOOC platform, well-known universities have brought some of their courses online (e.g., Coursera and edX). Also, more students are now choosing online programmes over traditional programmes (in traditional universities), to benefit from both tertiary education and work experience at the same time. However, online education is not without its challenges – students may feel isolated, disorientated or unmotivated (Mazza & Dimitrova 2004) and instructors may lack visual cues to interpret and evaluate students' learning (Dringus & Ellis 2005). On the positive side, online learning generates a lot of data (Ellen 2012), which learning analytics can use to facilitate students' learning and guide instructors' teaching (e.g., via adaptive learning (Romero & Ventura 2010)).

Thirdly, educational institutions are increasingly asked to measure, demonstrate, and improve performance (EU Expert Group 2010). Norris *et al* (2008) has reported investments in the order of billions of US dollars to increase the overall educational attainment of the population. Learning analytics is seen as a necessary methodology and technology towards improving education performance and attainment.

Kumar (2012) has suggested that the innovative transformation of the education landscape is driven by the following factors:

1. rapid development agenda to expand the access and quality of education;
2. increasingly unaffordable and unmanageable education costs;
3. greater agility needed for the rapidly changing knowledge and skills; and
4. a new generation of learners with highly differentiated types and levels of preparation.

With technology and online learning, the capture and interpretation of data in digital learning settings can help instructors and institutions tailor and optimise the teaching and learning process to individual students. Along the same line, Murphy (2012) has highlighted the importance and impact of technology and the digital media literacy of students in the new learning environment.

Learning Analytics Applications

Learning analytics' objectives are not all new in that educational institutions have long been involved in education research (McIntosh 1979; Tinto 1997). What are new, however, are the sources of education data and the analytical techniques. For example, the emergence of second-generation web has enabled the collection of web data, and the development of data mining tools has facilitated new approaches to data analysis (Ferguson 2012). In addition, social network analysis emerged in 2003 to complement the data-driven approach to learning analytics (Aviv *et al* 2003). It represents a social and pedagogic approach to study collaborative and co-operative connections between learners, instructors and resources, in order to help learners learn (De Laat *et al* 2006).

Categorisation of Applications

Romero and Ventura (2010), and Bienkowski *et al* (2012) categorised learning analytics applications by their objectives and outcomes, which in turn can be grouped into major categories that relate to students, instructors, institutional decision making, and learning/instructional design. For example, students can benefit from learning analytics applications that can create personalised recommendations of links to visit, and activities and tasks to complete. Applications can also adapt learning contents, interfaces and sequences for each particular student, e.g., to provide adaptive and personalised learning support (Guo & Zhang 2009).

Learning analytics applications for instructors include:

1. Provision of feedback to support instructors
   E.g., to study usage data to improve the effectiveness of the learning process in e-learning systems (Myszkowski *et al* 2008)

2. Detection of undesirable student behaviours
   E.g., to send warning messages to students with unusual learning behaviour in an adaptive educational hypermedia system (Jong *et al* 2007)

3. Grouping of students in order to build personalised learning systems to promote effective group learning and provide adaptive contents
   E.g., to identify and classify student learning styles (Chang *et al* 2009)

4. Social network analysis
   E.g., to develop a personal recommender system for learners in lifelong learning networks (Drachsler *et al* 2008)

At an institutional level, learning analytics applications frequently support decision-making. These processes include:

1. Analysis and visualisation of data
   E.g., to visualise weekly information on the activities of students and groups in collaborative e-learning (Juan *et al* 2009)

2. Prediction of student performance
   E.g., to model the probability that a multi-skill question will be answered correctly (Pardos *et al* 2008)

3. Student modelling
   E.g., to propose techniques to reduce model development costs and to facilitate transferability in intelligent learning environments (Amershi & Conati 2009)

4. Effect assessment to explore the probable effects of policy or decision changes
   E.g., in recruitment, admission and courses (Ranjan & Khalil 2008)

5. User behaviour modelling
   E.g., to detect patterns of interactions associated with more learning (Macfayden & Dawson 2010)

6. User experience
   E.g., to improve students' learning experience and success/retention rate (Dawson *et al* 2010)

7. Trend analysis
   E.g., to identify trends contributing to student success, programme progress, and course completion (Wireless News 2012)

With respect to learning and instructional design, learning analytics can be applied to

1. Development of concept maps, construction of courseware, and planning and scheduling
   E.g., to explore cognitive concept map differences in instructional outcomes (Huang *et al* 2006)

2. User knowledge modelling
   E.g., to deliver only content that the learner needs (Norris *et al* 2008)

3. User profiling
   E.g., to classify new learners in order to support customised engagement behaviour (Kardan & Conati 2011)

4. Domain modelling
   E.g., to fine-tune learning systems to better serve learners and instructors (Martin *et al* 2011)

5. Learning system components and instructional principle analysis
   E.g., to discover which pedagogical support is most effective (Beck & Mostow 2008)

6. Adaptation and personalisation
   E.g., to monitor and interpret sequential learning activities to improve adaptation and personalisaton of educational environments (Kock & Paramythis 2011)

Future Directions

In a more recent survey, Huebner (2013) identified gaps in the current literature and suggested opportunities for future research in the following applications:

1. Student retention and attrition
   - to discover at-risk students and help institutions become more proactive in identifying and responding to these students
   - e.g., to support and improve retention at the Bowie State University (Chacon *et al* 2012), the University went beyond research to implement a data mining solution in a production environment

2. Personal learning environments and recommender systems
   - to understand/determine the needs of learners; provide the tools, services and artefacts so that the system can adapt to their learning needs (Modritscher 2010); and allow instructors to control recommendations for their learners
   - e.g., to use network conditions, hardware capabilities, and user preferences to help provide fast, dynamic, and personalised learning content to mobile users (Su *et al* 2011)

3. Course management systems
   - to improve and support student learning outcomes and student success within course management systems
   - e.g., to customise learning exercises based on each student's progress through a course, and to create significant and optimal learning experiences for each student (Wang & Liao 2011)

While learning analytics are frequently discussed in the context of academic institutions, its application extends beyond these institutions to other organisations. Organisations such as banks, telephone companies, and departmental stores also collect vast amounts of data and can benefit from learning analytics by anticipating emerging problems, recognising new opportunities for strategic alignment, supporting performance and organisational growth; as well as facilitating more informed and more decentralised decision-making based on analytical frameworks and findings (Ellen 2012).

Further, as suggested by Tozman (2012), these (non-academic) organisations can apply learning analytics to convert "learning" data (e.g., questions that customers ask) into information that can make a favourable impact on the business (e.g., increasing the number of hits to the product pages or decreasing the average call-handling time). Van Barneveld *et al* (2012) suggest that industry (i.e., non-academic) learning analytics focus on employees and customers to manage organisational success, while academic learning analytics focus on learners to manage their success.

Other Analytics Applications

Analytics can be applied to non-learning, non-academic contexts; as evidence by the numerous applications in the business and commercial sector, as well as the government and non-profit sectors. One way to understand the analytics landscape is to view analytics as the application of data mining in a specific context. Hence, learning analytics is just the application of data mining in a learning context. Similarly, marketing and predictive analytics refer to the application of data mining in a marketing and prediction context, respectively. In addition, data mining can be perceived as the methodology and technology for transforming raw data into information for the purpose of decision-making. From this perspective, it is clear that there are other analytics that can be employed productively in higher education.

Human resource (HR) analytics is a case in point. Similar to the definition of learning analytics, HR analytics can be defined (LAK 2011) as *"the measurement, collection, analysis and reporting of data about employees and their contexts, for purposes of understanding and optimising employee outcomes (such as motivation, performance and turnover/churn) and the environment in which they occur"*. More generally, analytics applications can be developed for strategic, tactical, and operational decision-making. The data for mining can come from within the university (e.g., student or employee data) or from outside the university (e.g., economic or national demographic data). Where there is decision-making in higher education, there will be the potential for analytics to play a useful role in efficient and effective decision-making.

Singapore University of Social Sciences

For several years, learning analytics projects in the Singapore University of Social Sciences (SUSS; previously known as SIM University or UniSIM) were undertaken as ad hoc institutional research projects overseen by the President's Office: e.g., *Enrolment and Early Predictors of Academic Performance* and *An Exploratory Study of SUSS Associates – Establishing Baseline Knowledge.* When analytics was recognised as an important dimension of the University's strategic thrust, this approach to analytics was changed on 1 August 2016 with the establishment of the Institutional Research & Analytics Unit (IRAU).

In particular, IRAU was tasked to:

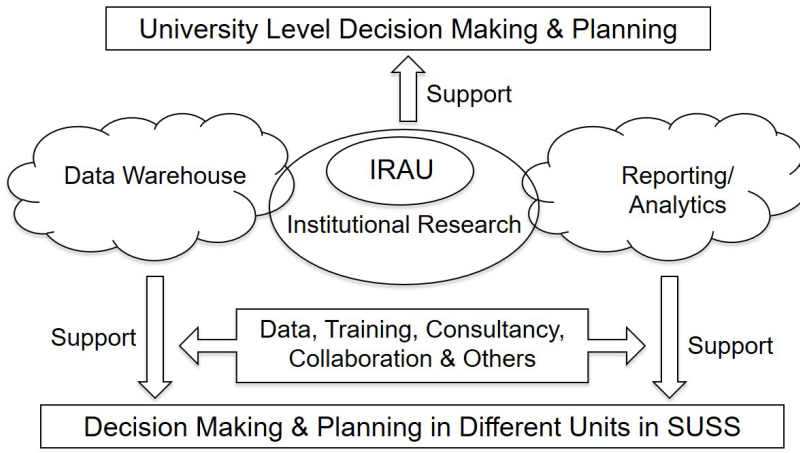
1. Set up the data infrastructure (in the form of an integrated database system and data warehouse) and analytics/reporting infrastructure;

2. Build up the analytics capability in SUSS, including providing analytics training and helping the different units in the University to formulate and implement analytics projects as well as deploy findings and models; and

3. Undertake institutional research and analytics projects of a strategic, tactical, and operational nature.

Underlying the above is SUSS' aim to generate information for decision-making and planning, covering areas such as admission and enrolment, programme and curriculum, teaching and learning, student and alumni relations, finance and human resources policy-making and evaluation, among others. Over time, the University hopes to cultivate a data-driven and evidence-based environment to empower decision-making and planning. All these can be represented by Figure 1 below.

Figure 1. Institutional Analytics in SUSS



Conclusion

The growth of learning analytics in higher education in the last decade has been impressive. The 2011 Horizon Report (Johnson *et al* 2011) identified learning analytics as a technology to watch, with it being four or five years from widespread adoption. The next report a year later (Johnson *et al* 2012) shortened the forecast to two to three years. In the latest 2016 Horizon Report (Johnson *et al* 2016), the time from widespread adoption has been further shortened to one year or less. In addition, adaptive learning is bundled with learning analytics.

More specifically in learning analytics, EDUCAUSE (a non-profit association whose mission is to advance higher education through the use of information technology) has identified the following among the top-ten IT issues in 2014: 1) improving student outcomes through an institutional approach that strategically leverages technology; and 2) using analytics to help drive critical institutional outcomes (Grajek 2014). In Grama (2015), the EDUCAUSE IT Issues Panel members reported that educational data mining and learning analytics are already and increasingly being used in administrative and academic areas in colleges and universities, in the three broad categories of institutional business, student engagement analytics, and student learning analytics. These have led to the improvement of experiences for students, faculty, staff, and others; as well as improvement in programmes and courses. Consistent with these developments, Marcus (2015) reported on how some universities have used learning analytics to reduce the number of students who drop out, increase the proportion of students who graduate, match students' academic strengths to their majors, and implement timely interventions to help students who need academic and other assistance.

Today, the reach of learning analytics has extended to more geographical regions, analytical tools are more accessible and easier to use, data collection is more standardised, learning environments and analytical techniques are more integrated, and more learning-related analytics have emerged as well as merged with learning analytics (Romero & Ventura 2010; Ferguson 2012; Jason *et al* 2016). However, the impending growth of learning analytics is not without challenges. Bienkowski *et al* (2012) highlighted technical challenges (i.e., lack of technical resources and lack of data interoperability and consistency), institutional capacity (i.e., human resources), and ethical issues (i.e., privacy protection) as barriers to implementation of learning analytics and educational data mining. In order for learning analytics to take another leap in its progress, new theoretical frameworks from the learning sciences, as well as more powerful analytical techniques will be needed. Not only that, new sources and collection methods of data, alongside a focus that goes beyond formal education, to informal education and lifelong learning, will benefit the growth of learning analytics.

Despite the challenges, learning analytics remains an exciting field to watch; in fact, applications of learning analytics in higher education are already developing rapidly (Jason *et al* 2016). This growth is expected to proceed with greater volume, velocity and variety – the 3 V's typically used to describe Big Data.

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Chapter 21

Cultural Competence and Lifelong Learning: Through the Lenses of the Humanities and the Social Sciences

TAN Soo Yean, NGG Genice and LIM Beng Soon

Introduction

The term 'cross-cultural intelligence' came into prominence in the work of Earley and Ang (2003); treated as testable, it has been used in tandem with other intelligence quotients. Most commonly, it refers to the skill to function effectively, in a culturally aware fashion, in unfamiliar business environments (especially cross-border ones). A related use of cultural competence is seen in the training of educators, healthcare practitioners, and similar professionals to understand the diverse characteristics of populations in order to better inform the interactions and interventions in the care of their charges. Recent observations of the rise of intolerance and fear of 'the foreign', in the rising popularity of groups of the far right and underpinning much of the new wave of nationalist sentiments, also hasten the acceptance of the importance of cultural awareness in an interconnected world.

Yet, the notion of cross-cultural competence is not without controversy. For one thing, it may betray assumptions about often abstracted entities such as national cultures, downplaying the many differences within these entities, and disregarding where the continuities and discontinuities end and begin. One criticism of popular forms of cultural competency training programmes and cultural intelligence tests is that they necessarily isolate cultural traits from context, neglecting that things, practices, and behaviours have a variety of meanings that can only be made sense of when situated. In academia, some cross-cultural comparative research struggles to ascertain if concepts such as 'religiosity', 'democracy', or 'happiness' carry the same meanings across different groups, while attempting to establish universal measures.

Researchers are also mindful of the interaction between psychology and culture and the challenges in cross-cultural comparison studies, for example, to distinguish between psychological processes and effects of culture revealed in the outcomes of such studies. Thus, Heine, Lehman, Peng, and Greenholtz (2002) find deprivation and reference-group effects may also account considerably for the way people from different cultural groups self-report their values than actual cultural effects. At the same time, cultural variations in psychological processes have also been found.

Another view is that no cultural grouping has existed without being connected with the rest of the world and that the making of a group and its identity relies on its interactions with others. The anthropologist Barth's (1969) work on ethnicity challenges the existence of discontinuous ethnic groups in favour of a focus on identity-building – boundary maintenance behaviours or work performed by one group to distinguish itself from another. A basic example of this process of boundary drawing would be subcultures that use an array of markers to define themselves against the dominant group's normative cultural expressions. In addition, narrow understandings of cultural groups disregard the politics of domination. Scholars such as PuruShotam (1995) have also cautioned about the practices of equating culture and race, as 'marks of enclosure' rather than positive forms of multiculturalism, even if originating from good intentions about respect for cultural heritage.

Limits of Cultural Competency Training

At times, the training of cultural competency relies on a simplistic notion that different groups of people occupy separate cultural universes, without this understanding extending into the causes of social differences and into the history and sociology of how these have been shaped. As such, some cultural competency training programmes, especially if hastily put together, appear to put forth deterministic views of culture and reinforce cultural stereotypes: for instance, the idea that Africans, Chinese, Arabs, or Japanese have particular cultural norms and worldviews. Hannerz (1990) tersely terms such diversity training programmes a 'culture shock prevention industry' (p245). In other words, intercultural competence and intelligence are themselves constructs or discursive cultural forms, arising in part from applied industries that emerged out of the need to, in Hannerz's words, *"inculcate sensitivity, basic savoir faire … and appreciation of those other cultures which are of special strategic importance to one's goals"* (p245).

Social science education can help us understand shortcomings of some of the more problematic forms of diversity training in the market, and expands our grasp of what

cultural understanding could mean. While there are many competing views about, and approaches to, studying culture among the various social sciences, at times antithetical to one another, social scientists are generally sensitive to the challenges of studying one's own society as well as across cultures, and caution against uncritical use of social categories.

Sociologists point out, for instance, that the chasm between the cultures of social classes can be as great as that between ethnic or national cultures. Tastes, political orientations and beliefs are at times tied more to one's social location than to other markers. Even when one acknowledges the utility of cultural awareness in navigating new environments, what would teaching of cultural competence and its strategies mean and look like for such vastly different groups as expatriates, indentured migrant workers, travellers, etc., whose access to culture as a resource differ so greatly? In addition, the constitution of culture and cultural difference is complex. When a group of international scientists from different countries collaborate, are the inevitable differences in the ways of practice due to ethnic culture, norms of national institutions (science culture), status group differences, power differences, or an amalgam of all the above?

Cultural training has its uses in specific contexts: community providers need to be attuned to the characteristics and needs of the groups they serve – be it social class background, gender, age, or unique occupational histories such as those of veterans (see Petrovich 2012, for instance). Intercultural competence has also been usefully incorporated as a component of language teaching, since linguistic and cultural competence overlap. Carefully done, it importantly reduces inequalities and disparities in the outcomes experienced by various groups.

Approaches to Understanding Culture: Contributions from the Social Sciences

The social sciences each offer useful analyses of human society, and social and cultural behaviour. From understanding social phenomena and social structures, to communicative and personality structures, such competence is embedded in the perspectives of various social sciences. For example, cultural knowledge is implicit and taught in W. I. Thomas' classic sociological dictum that *"if men define situations as real, they are real in their consequences"* (as cited in Appelrouth & Edles 2008 p481). The beliefs of different groups, whether in science, God, gods, witchcraft, or animism are equally real; the explanation of which is then sought in social organisation. As illustrated so far, sociology and anthropology are likely to facilitate cultural understanding by situating behaviours amid institutional and other contexts, thus avoiding deterministic views of self and behaviour.

Similarly, Castells (2000), in the field of sociology and communications, argues that information technology has created new social and cultural forms, such as the network society which has reshaped relationships and spatial and temporal flows. Likewise, psychological research offers the understanding that there are cultural variabilities in psychological processes: for instance, Heine *et al* (2001) find a view of the self as improvable or changeable more common in cultures that emphasise interdependence. Training in sensitivity to cultural differences is already practised in effective crisis communication in the syllabi of communication programmes.

One should however guard against the transmission of cultural information as a quick fix, or as a substitute for more valuable forms of the training we propose below. Cultural knowledge has to be, first and foremost, a reflexive endeavour, requiring the conscious location of one's self in a particular sociocultural and political context. Thus, it is our opinion that a few basic principles that inform enquiry can go a long way in fostering this – a set of principles that should inform our own approaches to thinking about things, in readiness to doubt one's own cultural assumptions and pre-given categories, destabilising them.

In other words, what a training in the social sciences best offers for developing cultural competence lies in their approach. The above questioning of assumptions is in fact derived from the many practices in the social sciences that caution human beings against our own hubris: be it various types of bias in psychology, de-familiarisation in sociology, or the problem of equivalence in research methods. An idea particularly close to ethnology and anthropology is to beware one's own ethnocentrism – the tendency to evaluate another's culture using one's own frame of reference often results in a view of the superiority of one culture over another. Instead, one should look upon the practices of one's own culture as strangely – and needing explanation – as those of others. The need to problematise or question one's own framework is one of the lynchpins of the conduct of the science of human society that we have to continuously revisit.

Sociology as an enterprise valuably stresses de-familiarising (or looking for the strange in the familiar) one's own systems and practices that we would otherwise not recognise as being culturally specific to a time and space. Thus the concept of medicalisation that accompanied the rise of the healthcare and pharmaceutical industry, to use an example in sociology, alerts us to the powerful process by which behaviour or conditions not previously seen as illnesses (such as childbirth and social anxiety) come to be increasingly defined and treated as medical conditions whose only viable solution is a medical one (Conrad 2007). These types of studies undertaken of particular cultural systems facilitate the understanding that the system of medicine we think of as universal or natural is anything but.

The second fundamental principle is empiricism – that knowledge and understanding can only come from tested observable evidence, again a lynchpin of most social sciences. Third, particularly in fields like sociology and anthropology, culture is defined more holistically, and behavioural elements and their meanings cannot be understood apart from the larger collective structures and contexts in which they are located.

Together, these three principles that are the very foundation of a number of social sciences – a vigilant methodology upholding equivalence and avoidance of bias; empiricism; and lastly, an openness in the assumption of the contextual nature of human activity, and thus acceptance of divergent cultural beginnings and ends – can form the basis of a plausible training approach towards a critical cultural consciousness. The long history of empirical research already demonstrates how culture is shaped by interaction between local and other contexts, by borrowings, and characterised by syncretism: be it religious practice, language, cuisine, politics, economics or other aspects of culture in this region, they all exhibit characteristics resulting from the historical proximity and interaction of heterogeneous groups and influences in the region and beyond, and are also the product of diasporic and other histories.

Linguistics and the Singaporean Advantage

In addition to the social sciences, specialisations in the study of languages and literatures offer ways of looking at culture. In linguistics and the study of translation and interpretation, explicit analyses of the manifestations of culture in appropriate speech and discourse are often pursued at the undergraduate level. These language studies discuss elements of intercultural competence, particularly through an analysis of speech acts and discourse, so that students appreciate the inner workings of how culture is intertwined with language. In short, language carries with it the history, culture, and idiosyncracies of its speakers; and communication cannot be divorced from the culture of its speakers. In the field of translation and pragmatics, concepts of form and function are introduced, including how the same forms when translated can have very different functions.

The concepts of positive and negative face cultures (Brown & Levinson 1987) for example help students understand the concepts of politeness in language. The utterance in the form 'would you like some tea' in a culture where participants of an interaction are expected to address and affirm the feelings of fellowship and camaraderie, is perceived as a genuine invitation to partake tea. But in a culture where people value their privacy and freedom, the same utterance can be perceived as a dismissal and that the transaction of the day is over, and hence one is invited to take one's leave. Concepts in semantics and discourse studies provide an insight into the study of meaning beyond that of denotative meaning

in dictionaries and reflect on the different projection of identity when language is used. They allow students to learn about identity, language, and power, and more importantly in multicultural Singapore, how multicultural and multilingual identities are perceived and projected. The argument that one's language influences one's worldview was proposed in the 1950s by two eminent sociolinguists, Edward Sapir and Benjamin Lee Whorf (Kay & Kempton 1984). From this perspective, the bilingual Singaporean would have access to more than one worldview since he or she knows that to communicate effectively is to communicate appropriately in both languages.

For example, when we ask for things, we usually employ some modicum of politeness and vary our requests according to the appropriate discourse of the language community. Say in a western English setting, a request for two cups of coffee at a restaurant would entail saying 'Could I have two cups of coffee please', whilst a similar request in Malay should be rendered as 'Two cups of coffee', which is a bald on record demand. A person with a highly developed sense of intercultural competence would pick up these nuances in the styles and discourse structures quickly when making requests in a restaurant setting. Hence, it is impossible to study a language without understanding more of its culture – and this knowledge functions as the bedrock of intercultural communicative competence.

As early as in 1978, when Singapore's bilingual policy was shaped, its architect, the then Prime Minister Lee Kuan Yew, already had a vision that bilingualism will endow the speakers with intercultural competence (Low 2017 p72). With hindsight, after almost forty years since bilingual education was first implemented, students could acquire some intercultural competence and a nuanced understanding of language and culture. In short, a bilingual Singaporean who has gone through ten to twelve years of schooling in two languages may be better prepared to navigate different cultural contexts. That said, a conscious effort to make the populace more aware of their bilingual facility and its advantages in multicultural Singapore and global settings is perhaps desirable.

Literature, Cultural Competence, and Global Awareness

Literature in any language, from any country, offers a creative reflection on issues and experiences of individuals and communities located in a particular time and place. Yet the disciplinary approach of literature – and the humanities as a whole – barely refer to cultural intelligence or competence, which is, after all, a competency identified in the late twentieth century. Like the social sciences, the value of the humanities approach in today's interconnected world is its attention to contexts: situating any human experience in a particular time and place, with its associated values, practices, and social structures, open to internal changes and external influences. Humanities students can hone their cognitive

skills in cultural competence when they acquire critical understanding of race, class, gender, and nation; their affective skills can be nurtured by the disciplinary focus on the interconnectedness and complexity of all human experiences.

Dramatic texts yield another kind of rich resource in approaching cultural competence: theatre and film highlight the importance of settings, different viewpoints and reception; and theatrical elements such as scripting, staging, and role-playing can be adopted in behavioural training programmes to prepare individuals for cross-cultural interactions.

The attention to contexts cultivates another twenty-first century competency that goes hand-in-hand with cross-cultural competency, and that is global awareness. In the history of literary disciplines, the world is a necessary context when we consider comparative literature, world literature, ethnic literature, post-colonial literature, and literary and cultural studies. The cultivation of a global mindset is evident even in the study of so-called 'classic' literature. An excellent example is Shakespearean studies: the question of relevance is typically raised, debated, and discussed in classroom settings. One course offered by the Singapore University of Social Sciences (SUSS), *Shakespeare on Film,* contextualises Shakespeare's plays and films squarely in the present digital age. Any assignments on staging and film productions of Shakespeare's plays, say in multicultural Singapore, will challenge students to consider the social and cultural dimensions of the play to create meaning for today's audiences.

Competencies, Higher Education, and Lifelong Learning

Cultural competence of an individual can be demonstrated at three levels: cognitive, affective, and physical – or in terms of the head, heart, and body (Earley & Mosakowski 2004). So far, we have primarily argued for the development of the first two aspects in the humanities and the social sciences. The behavioural aspect is critical: it should be the litmus test of cognitive and affective cultural competencies – not a perfunctory act, nor some practised role-playing. Demonstrations of cultural competence and global awareness in action must come from a lifelong process of self-directed experiential learning displaying sensitivity in intercultural settings.

The three aspects of cultural competence correlate with the three H's of SUSS' education philosophy – cultivating professional competencies through the *head*, nurturing social consciousness through the *heart*, and promoting the *habit* of lifelong learning. Acquiring, demonstrating and improving cultural competence is essentially not that different from an education philosophy about deep learning that is embraced cognitively, affectively, and behaviourally throughout a lifetime. This approach towards developing competencies is

in fact enforced at a national level in Singapore, primarily through the SkillsFuture movement. Deep skills and lifelong learning, reports the Singapore's Committee on the Future Economy, are vital in transforming the workforce for the future (CFE 2017).

What is the role then of the humanities and the social sciences in higher education, given the national push towards acquisition of skills relevant for the future economy? Will the 'softer' disciplines be sidelined by technological and digital disciplines that appear more able to prepare the workforce for technological disruptions? This chapter has argued that the approaches in the humanities and the social sciences can cultivate indispensable global and cross-cultural understanding – identified by Singapore's Ministry of Education as two twenty-first century competencies required of every student (MOE 2015). The humanities and the social sciences readily demonstrate their relevance beyond narrow disciplinary knowledge in their inherent ability to address broad competency-based goals.

This idea of competency-based higher education has already been proposed: the 'Stanford 2025' project envisions interdisciplinary learning that develops original core competencies such as 'creative confidence', 'social inquiry', 'aesthetic interpretation', and 'engaging difference' (Stanford University 2015). Such an approach advocates 'transdisciplinary thinking', an essential skill in the Singapore Skills Framework of eighteen generic skills, including 'a global mindset' and 'lifelong learning' (SkillsFutureSG 2017). Such competencies require continuous acquisition and application of knowledge and skills, and indeed, all competency-based learning must be cultivated in students as lifelong goals, beyond narrow disciplinary learning, through a variety of experiential engagements, such as service learning, applied cross-cultural projects, and international collaborative exchanges.

Perhaps the three principles discussed earlier in this chapter, serve as an embodiment of the best of lifelong learning: accepting that any body of knowledge cannot ever be highly abstracted nor pre-determined, but must continually be subject to verification tests. Successful lifelong learning requires that ever questioning disposition and the empiricist approach of the social sciences that always seeks to observe and verify based on changing conditions, and then revise one's prior conceptions, serves as a useful principle not only for social science research but also for learning in general. Cross-cultural intelligence is not about internalising scripted views of other cultures. Cultural competence is not a singular or one-dimensional activity or skill; it requires an ethnography of sorts, to appreciate the situated nature of people's thoughts and actions.

Objectivity in the conduct of research notwithstanding, true cultural competence requires that we become respectful conscious participants in the shaping of culture, not observers, nor modern colonialists. It also entails that minimally we should hold the view that people

are active agents shaping their own interests, identities, and situations in response to local and global conditions – they are not passive exhibitors of cultural traits; as such we should not take the stance that people elsewhere are merely living a better or poorer version of our own lives. We must also be mindful that we do not take encounters with others as stereotype-forming exercises, but recognise that culture is instead a matrix of practices, beliefs, values, and social organisation as a result of specific social and historical environments and experiences, and consequently examine how cultural encounters can facilitate exchange and understanding.

Conclusion

Finally, one must not take appreciation that can take place across cultures to be the panacea of all problems. Despite efforts to understand culturally different ways of doing things, material constraints, as well as constraints of the social environment, limit how much people can accommodate divergent ways of doing things. Conflicting interests and beliefs cannot be readily resolved and are reflections of occasions when belief systems, cultural and religious rights, and even laws clash. A case in point is the 2014 Supreme Court ruling in the United States: companies whose owners object to the use of contraception on religious grounds are able to withhold coverage for contraceptives to its employees (Barnes 2014), at once a clash of culturally-specific rights pertaining to reproductive rights, religious liberty and others. Economic and social inequalities will exacerbate socio-political and cultural conflict, and cause people to abandon arguments for inclusiveness, even with economic evidence of its benefits. Nevertheless, the understanding of the origins, logic and processes of divergent systems of opinions playing out on the same terrain is the vital first step to some form of resolution or compromise. Only then, may we take culture to be something approaching what Raymond Williams (1989) terms 'resources of hope', albeit in a somewhat different context.

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Chapter 22

Linking Theory and Practice in Rapid Knowledge Obsolescence Environment

CHEAH Horn Mun

Theory-Practice Link in Higher Education

The advent of Internet technologies in the early 1990s significantly accelerated the growth and impact of the knowledge-based economy. In particular, the pace with which knowledge is created and shared has left formal education playing catch-up in various fields, especially those that are technology-dependent. More importantly, the contribution to this exponential growth of knowledge is no longer dominated by the academia, but is likely to come from a diverse collection of knowledge communities interacting within a highly connected environment. The sheer volume and depth of knowledge are also leading to increased career specialisations as it is nearly impossible to expect an individual to acquire and apply such a vast amount of skills and knowledge. On the whole, in an environment where a significant portion of what is learned can become obsolete quickly, the challenge for higher education is to get the right balance of learning for knowledge acquisition, skills set for continual learning and the development of depth of thinking (Devlin & Samarawickrema 2010). When effectively developed, these can form the basis for the learner to continually respond and adapt to the fast-changing demands of the knowledge-based environment. Perhaps just as importantly, these would also provide the platform for a more seamless bridging between theoretical understanding and practical application.

In the context of an economy which values the ability to bring learning to bear quickly within the working environment, being able to develop this seamless bridging forms a key aspect of higher education. However, while theory and practice have often been accepted as integral parts of higher education, many practitioners and scholars experienced these as separate spaces (Mullen *et al* 2005). In fact, theoretical learnings and practical knowledge have traditionally been perceived as being at variance with each other (Van de Ven 2006), with a stronger preference for the former in higher education (Katajavuori *et al* 2006). Despite this conflict, theory and practice recognised to be inseparable (Simmons 2016) as theoretical learning would inevitably be expressed through practice in one form or another. The effective development of both represents a significant challenge to the design and delivery of higher education curriculum. However, as is often the case, theory and practice are offered as separate courses within a curriculum, with the resultant learning being defined and possibly constrained by how the curriculum is designed (Simmons 2016).

In discussing theory-practice (T-P) link, it is useful to have a working definition of what constitutes theoretical and practical knowledge. Broadly, a theory can be thought of as a framework that can explain or account for observations within the applicable context of the theory. The theoretical knowledge acquired then represents an understanding of the basic premise of the theory as well as its range of applicability. The advantage of a well-developed theory is its applicability beyond observed data, which affords it a degree of predictive capability that also serves as a test of the theory itself. In contrast, practical knowledge is often derived from connecting the ways in which things work with what has been done, i.e., a collection of experiences that enable the practitioner to use as the basis for future actions when operating within similar context. Often, practical knowledge does not need a theoretical explanation of the observed phenomenon or behaviour. Its acquisition results in the development of a set of skills that allows for the satisfactory completion of the action, such as the construction of a dry wall by someone with extensive experience. It is important to note that clear delineation between theoretical and practical knowledge within any particular sphere of knowledge is difficult, as the two are often intertwined. As such, it is easier to assume that both exist within a learner, with the difference primarily being one of balance and degree.

The task of forging a strong theory-practice link has led to debates on whether to start with practice and link practice to theory through an inductive process, or to start with theory and move deductively to practice (Winch & Clarke 2003; Hager 2004). Both approaches, when executed in isolation, have their own difficulties. For instance, in the case of vocational programmes (Simmons, 2016), the teaching of theoretical concepts was done by experts in a different department from the vocational department. The teaching

then tended to depend on the lecturer's determination on what should be covered, the sequencing of the topics, and how the concepts are presented. On the other hand, using practice to 'front' the courses, with theories being integrated where necessary, could make the learning of the underlying theoretical concepts incomplete, rendering their extension into unfamiliar context in the future difficult for the learner. These approaches to curriculum delivery have the effect of keeping theory and practice apart.

To allow theory and practice to be mutually reinforcing during the learning process, Simmons (2016) argues for making 'reasoning' central within teaching and learning interactions. This entails integrating a process to develop the habit of asking for, and giving reasons to, the various learning situations encountered as the students acquire knowledge and develop skills. In particular, the students would need to ask 'why' questions to help them apply theoretical knowledge within the workplace, giving forms and meanings to the actual practice. Learning can be further enhanced when there are real or apparent discrepancies between the theoretical basis of a practice and the actual practice. These allow the students to contest the learned knowledge such that the successful resolution of which can help to deepen both their theoretical understanding and practice. On the whole, the incorporation of 'reasoning' within a higher education curriculum would require an extensive and fundamental reshaping of teaching and learning interactions, as well as constructing assessment practices that can effectively assess the achievement of this capability.

An alternative way to address the linking of theory and practice is to view the challenge as both knowledge transfer and knowledge creation (Katajavuori *et al* 2006). To achieve this, theory, practice and the ability to reflect critically on the practice of theoretical knowledge will need to be effectively integrated throughout the learning experience of students in higher education. This allows for knowledge to be 'transferred' between theory and practice, with the intervening process of reflection and critical thinking creating a 'new' integrated knowledge that weaves the two together. While Simmons (2016) argues for a 'reasoning' approach, Katajavuori (2006) proposes a process of *engaged scholarship*. This process is essentially a form of collaborative inquiry that encourages academics and practitioners to draw on their respective perspectives in order to co-create knowledge, particularly for a complex problem within an uncertain environment, i.e., those that are often found in the real-world context. The implications of this approach, if exercised within a higher education curriculum, are two-fold. First, there is the need to re-examine how different disciplines and professional domains need to be co-located within the curriculum. This is likely not to be a case of simply mixing and matching, but one which demands a significant degree of flexibility in bringing together academics and practitioners. Second, and perhaps more importantly, is the need to have the capacity to facilitate such

co-creation of knowledge, requiring the facilitators to possess sufficient understanding of both theoretical and practical knowledge. At the same time, facilitators would need to draw on theoretical knowledge to explicate on practice, and vice versa. The facilitation need not be confined to faculty members, as extending such facilitations to the students can be constructed as part of their learning process as long as sufficient guidance and scaffolding are provided. In fact, being involved in facilitation would allow the students to 'practise' the integration of theory and practice.

Regardless of how teaching and learning interactions are designed to enable T-P link, it is reasonably clear that concerted efforts in terms of curricular and assessment practices would be necessary. The actual form of such efforts will depend on the T-P principles being applied, the nature of the discipline, i.e. to what degree T-P links can be established in each disciplinary area, the existing and projected human resource capacity of the institution, and the physical infrastructure that can enable T-P link practices. The level of institutional commitment to bringing about T-P link within the curriculum would need to be sufficiently strong.

Framing Theory-Practice Link in the Local Context

A key step in strengthening Theory-Practice link in an institution is the need to have a common understanding of what it constitutes in the context of the institutional teaching and learning interactions. To this end, when applied to the curriculum of the Singapore University of Social Sciences (SUSS), it is useful to think of T-P link as having a bi-directional relationship between the design and delivery of the curriculum, and the student's relevant real-life experiences. Note that the design and delivery of the curriculum encompass the theoretical basis of the content as well as the teaching and learning interactions that are employed to bring about learning. The two questions that emphasise this relationship are:

1. To what extent is the syllabus and the delivery of the curriculum weaved into the learner's experiences?

2. To what extent does the learner's relevant real-life experience inform the design and delivery of curriculum?

The first question aims to address the process of bringing theory into practice. It requires that the design and delivery of the curriculum take into account the extent to which the acquired theoretical knowledge can be usefully applied to the learner's work context. This does not mean that each piece of learned theoretical knowledge would need to find an outlet to exemplify its applicability, although a representative amount would be desirable.

More importantly, the process through which the learned knowledge can be expressed in meaningful, relevant and practical ways has to be explicitly articulated and implemented in the curriculum. In being able to apply this process, the student will have an important tool to bring theoretical knowledge to bear on his or her work context in a continual manner even after the completion of his or her higher education studies.

For most curriculum, being able to bring theory into practice represents a successful linking of theory and practice. However, for practitioners operating in a context where the relevant theories are primarily formulated based on a different environment, just bringing theory to practice is not sufficient. In such cases, the curriculum needs to be a dynamic entity that allows for the theoretical knowledge to be informed by practice from a different context, so that it can be refined and hence strengthened. The answer to the second question addresses this, placing equal importance in the reverse direction in a T-P link, i.e., from practice to theory. Broadly, it means that teaching and learning in higher education would need to incorporate processes and practices that allow the learners, through their actual encounters with the practice environment, to provide inputs to affirm or refine the learned theoretical knowledge. Some examples of how theoretical knowledge can be brought to bear on actual practice, and how actual practice can inform the refinement of theoretical knowledge are as shown in Table 1 below.

Table 1. Examples of Theory to Practice and Practice to Theory

Curriculum Weaved into Practice	**Practice Informing Curriculum**
a. Use real-life experiences to illustrate the application of a theory. b. Generalise actual experiences into theoretical understanding, and subsequently apply this understanding in further actual experiences. c. Assess the application of theoretical learning in actual experiences. d. Address actual challenges faced using theoretical understanding, and discuss the efficacy of such application.	a. Use real-life experiences to design syllabi balanced content coverage and assessment. b. Use real-life experiences to help shape the actual delivery mode of lectures, tutorials and assignment. c. Use the application of knowledge in real-life experiences to ascertain the efficacy of curriculum design and delivery. d. Use real-life experiences to inform theoretical understanding.

In general, moving from practice to theory is more challenging to implement than the reverse. In fact, examination of courses and modules in most higher education institutions would likely reflect this. To bring practice to theory, two key sets of processes are necessary. These are (i) students' critical reflections on practice; and (ii) the capture, distillation and incorporation of informative inputs from the reflection process. For students' critical reflection on practice, the design of the teaching and learning interactions need to be such that the reflections serve to examine whether the practice within the students' respective work context can be adequately understood within the theoretical framework that they have learnt. If it is, the learning experience will help to affirm the application of the theory in a real-world context, lending greater depth of understanding that only 'theory-in-action' can provide. If discrepancies arise, the exercise in resolving them is invaluable to understanding the theories better, and could contribute to the refinement of the theories. The challenge for teaching and learning is then the enactment of the set of processes that can capture the reflection inputs of the students, and importantly, the analytical treatment of such inputs to either affirm the theory or the use of evidence to bring out the limitations of the theory. As stated earlier, this will not only lead to a greater understanding of the integrated theoretical and practical knowledge; it could also potentially help to re-frame the theoretical concepts that befit the local working context.

Evaluating Theory-Practice link

By defining the T-P link as a bi-directional process, the learning outcomes can be better specified, which, in turn, provide guidance for the formulation of teaching and learning interactions within courses or modules. To achieve this, it is necessary to articulate the expected behaviours of the students that best demonstrate the ability to weave together theory and practice. Table 2 provides a framework for handling the attributes of T-P links as well as their associated behavioural indicators. This is a working formulation subject to refinements as understanding of T-P links deepens through application in actual courses within higher education programmes.

The attribute associated with 'theory-to-practice' pertains to the student's ability to practise with theoretical understanding. This can be determined through the set of behavioural indicators shown in Table 2. Broadly, students need to demonstrate the ability to relate observed practice to theoretical understanding. At the basic level, this translates into being able to identify the link between theory and practice as well as the nature of this relationship. At a higher level, the student is expected to be able to apply theoretical knowledge to solve problems encountered in practice. For instance, in the domain of initial

teaching training, to handle a rowdy classroom, the student-teachers can use concepts in classroom management to create practices that can address the behaviour of the class, implement the practices then evaluate if the practices are effective. While this may not always be possible, being able to at least frame the problems within the theoretical space would be an important early step. Overall, it calls for students to be 'reflective practitioners' (Johns 2017; McKernan 2013).

Table 2. Attributes and Behavioural Indicators for Theory-Practice Link

	Attributes	**Behavioural Indicators**
Theory to Practice	Ability to enact practices based on theoretical understanding	• Apply knowledge to solve problems • Justify practices based on knowledge • Ascertain the effectiveness of practices • Plan translation of theory into practice • Monitor the progress and process of practice enactment
Practice to Theory	Ability to take the learning from practices to inform theory	• Seek mastery of practice • Monitor the effectiveness of theories • Identify discrepancy(ies) between practice and theory • Provide suggestions to address discrepancy(ies) • Affirm practice alignment to theory

For 'practice-to-theory', the attribute sought is the ability to use practical knowledge to inform theoretical knowledge. This entails behaviours that consistently monitor the applicability of the theories to the practice context and to be discerning enough to identify and articulate any discrepancies that arise. Both require the students to have a strong grasps of theoretical and practical knowledge, as well as the analytical skills to create integrated theory-practice knowledge. At a more demanding level, students would also formulate plausible explanations when discrepancies are encountered.

These sets of behavioural indicators are designed to serve as the basis from which to develop assessment strategies that measure the effectiveness of the course or module in weaving theory and practice into an integrated set of knowledge. It is important to note that each indicator operates at a macro level, such that the specific behaviours under each indicator will depend on the subject matter of the course or module. For instance, what constitutes 'using knowledge to solve problems' would differ for different subject areas. In the classroom management problem highlighted above, the theories involving class discipline can be applied and evaluated in the practice context. In the case of problems encountered in urban planning, the solutions derived from theoretical understanding would not be easily tested for the duration of a course/module of study. As such, the evaluation of the ability of the student to demonstrate the behaviour, as exemplified by the behavioural indicators, might need to be done under simulated conditions. In each case, the framing of the context and associated assessment of the students' understanding and practice would need to be carefully designed. This is likely to be the same for each course or module, let alone the different disciplinary areas.

Conclusion: Forging Theory-Practice Link in Higher Education

In the context of a knowledge-based environment that has the characteristics of rapid obsolescence of knowledge and skills learnt in formal education, the forging of a set of skills that can integrate theoretical and practical knowledge would make the learner competitive in the workplace. To this end, higher education has the responsibility to develop such skills in its students. Starting with a clear understanding of what this constitutes and applying it to curriculum development, it is possible to create teaching and learning interactions that can effectively cultivate these skills. These interactions would include pedagogical and assessment approaches that are explicitly targeted for the development of T-P integration skills. The undertaking is likely to be extensive, and probably require continual refinements.

Note that while the evaluation framework as outlined in Table 2 above can be applied in general, the actual teaching and learning interactions that are required would also differ for different disciplines. For instance, in social work programmes, *active learning* can be used as the glue that bridge theory and practice (Wrenn & Wrenn 2009). In this case, the teaching and learning interactions actively encourage students to listen more, ask questions, reflect on their own feelings and observations outside classroom, and uses videos to provide scenarios for students to learn. In contrast, a *holistic curriculum*

development approach was adopted for a business undergraduate course (Price & Feehily 2004), where different perspectives were taken into consideration, including desired graduate attributes and pedagogical models, during the process of curriculum development. This collaborative effort involving both academics and practitioners was able to tap into the 'fluidity (of the process) and capture the resulting creativity'. The implementation of this curriculum required students to develop research techniques to solve problems based on cutting-edge business research.

Once the desired attributes and learning outcomes are established, the curricular response in reviewing the courses and programmes with a view to effectively integrate theory and practice will bode well for a university with a strong focus on teaching and learning. Coupled with assessment practices that can validate the learning outcomes, a significant contribution can be made towards adequately preparing a workforce for a knowledge-based economy.

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Chapter 23

What Does It Mean To Be a University for Lifelong Learning?

TENG Su Ching

Preamble

> *"All the world is my school and all humanity is my teacher."*
> *George Whitman*

Here are some questions to explore on the topic:

- What did lifelong learning mean to the founders of SIM University (UniSIM; the former name of the Singapore University of Social Sciences or SUSS) when they chose it as something to strive for?
- What does lifelong learning mean to the faculty who have to design industry-rel evant courses and programmes?
- What does it mean to our working adult learners who aspire to a degree so that they can be assured of better jobs or career progression?
- What did the government have in mind when it made fostering a lifelong learning culture one of the aims of the national SkillsFuture movement?

Concept

Lifelong learning broadly refers to a learning process which spans the whole of a person's life. However, more specifically, it means different things to different people. The conceptual confusion arises because of people's perception of its purpose. In particular, many associate lifelong learning with older people continuing to stay cognitively engaged to mitigate social disengagement. Still, many institutes of lifelong learning convey this same sentiment: *"not only will you make discoveries that may change your life, you'll meet many a life-loving friend"*. There are also others who associate lifelong learning with "teaching a man to fish" so that he can be self-reliant. Finally, it is most often associated with going back to school to complete a degree or two, some to prepare for a new career and others to attainment some personal achievements.

According to Professor Cheong Hee Kiat, President of SUSS, it was quite natural to adopt lifelong learning as the University's vision as we started out providing skills and knowledge and upgrading pathways for working adults, those who had earlier on left formal education and went to work, and later returned to school to continue their education. Norman Evans (2003) in his book "Making Sense of Lifelong Learning" wrote about this phenomena, stating that *"lifelong learning may be seen as an elaborate game of catch-up."*

Today, the most appealing argument is economics. In fact, this underscores Singapore's national SkillsFuture movement, embedded in its industry transformation masterplan and industry manpower plan. The underpinning idea is that a country's competitiveness depends on the level of skills of its workforce. There is thus the continuous need tor lifewide upskilling to maintain the competitiveness of individuals, as well as for the whole nation.

Framing Lifelong Learning

In 1996, the UNESCO Education Commission chaired by Delors produced the 1996 Delors Report. Written during the period of rising unemployment and the continuing inequalities in development throughout the world, the report declared that pursuing all-out economic growth can no longer be viewed as ideal. It stressed the importance of education as the heart of personal and community development, and also the importance of continuous education to meet the challenges of new situations in one's personal and working life:

> *"There is a need to rethink and broaden the notion of lifelong education. Not only must it adapt to changes in the nature of work, but it must also constitute a continuous process of forming whole human beings – their knowledge and aptitudes,*

as well as the critical faculty and the ability to act. It should enable people to develop awareness of themselves and their environment and encourage them to play their social role at work and in the community."

In the Delors Report's framework to lifelong learning, it proposed the "Four Pillars of Lifelong Learning":

1. Learning to know. Acquisition of certain types of knowledge within formal education
2. Learning to do. Acquisition of competence and skills
3. Learning to be. Acquisition of self-knowledge and self-understanding, and the development of the whole person
4. Learning to live together. Recognition of our interdependence and the need for cooperation and collaboration

Policy Instrument: Europe's Example

Lifelong learning has become a policy strategy for governments as they see it contributing to the development of citizenship, social good, employment, sustainable economic growth, and individual personal fulfilment. In this aspect, Europe led the way. The continent has been the standard bearer for lifelong learning since the 1970s when the term used was "lifelong education", which was later replaced by "lifelong learning" with its focus on the lifewide learning processes of individuals instead of education systems. The key developments for lifelong learning in Europe are summarised in the paragraphs below.

In 1996, OECD Education ministers adopted "Lifelong learning for all" as a policy framework with the following imperatives: 1) that all learning must be recognised including informal and non-formal learning; 2) that focus should not only be on content but on the learner; 3) that there should be access and opportunities to cater to multiple learning needs; and 4) that multiple stakeholders are involved and all should contribute to lifelong learning efforts.

The 1999 G8 charter was drawn up for a renewed commitment to lifelong learning by Governments in investments, by the private sector in employee training, and by individuals who must take responsibility for developing their own abilities and careers.

In the Lisbon Strategy (2000), the European Council declared to make Europe *"become the most dynamic and competitive knowledge-based economy in the world by 2010 capable of sustainable economic growth with more and better jobs and greater social cohesion.*"

The EU Commission Lifelong Learning Programme (2007-2013) was set up to study the contribution of the education system towards creating *"a lifelong learning society in Europe"*.

The Programme (2007-2013) defines lifelong learning as:

> *"… all general education, vocational education and training, non-formal education and informal learning undertaken throughout life, resulting in an improvement in knowledge, skills and competences within a personal, civic, social and/or employment-related perspective."*

Civic associations in this dynamic lifelong learning ecosystem add muscle to the idea of lifelong learning as the panacea to challenges of modern societies. One such advocacy group is the Lifelong Learning Platform of the European Civil Society for Education, a non-profit umbrella organisation comprising activists who call for inclusive and democratic educational systems for social justice:

> *"Educational institutions should be encouraged to open their doors, adapt to learning diversity, and build sustainable partnerships to allow individuals to build their own learning pathway."*

Their 2015 Manifesto calls for mechanisms to validate and recognise non-formal and informal learning especially for those who need recognition for their competencies.

New Learning Ecology

Formal learning (taking place in schools and universities) has been described as the tip of an iceberg and informal training forming the submerged two-thirds. In fact many people need and acquire new skills and knowledge at the workplace or in social groups throughout their lifetime. With the rapidly ever-changing economy, the capacity to develop new skills are expected of all employees. Such workplace learning comes in the form of on-the-job training, mentoring or coaching. Such informal workplace learning has become a very important part of lifelong learning.

What is possibly lacking is the formal recognition of informal learning, to motivate individual learners and allow them uninhibited access to further development in both formal and informal settings. Alongside that, we are seeing rapid changes in the technological space which enables the individual and challenges institutions and old ways of learning.

Today's digital technological advances have brought to us a new learning ecology, with an updated thinking about learning. Connective communication technologies have resulted in rapid diffusion of information. With new fields, there is a need for new skills. The individual has become the centre of policy, and we cannot rely on existing ways of educating and training the workforce. According to the Institute of the Future, Palo Alto, we are in the era of learning flows, There is a new environment in which learning is conceived as a flow and learners increasingly have the ability to "autonomously dip into and out of " the continuous learning flow.

The Institute identified key shifts that will have an impact on our thinking about learning:

- From episodic to continuous learning
  In an era of learning flows, opportunities for learning are potentially embedded into every activity and encounter. Structured learning will become passé as mobile devices, content commons, and collaborative platforms make learning possible anywhere at any time.

- From assigning to enticing with content
  In the era of learning flows, information and knowledge resources are everywhere and accessible. The self directed learner will thrive and others may be left behind. The role of the teacher is to 'entice' people to navigate the new learning ecology by helping them become self-directed learners.

- From content conveyors to content curators
  The teacher curates relevant content as the amount of information grows quickly and may just as quickly become dated. In this environment, curation – the ability to find, consolidate, and deliver needed information and learning resources at the right time and in the right context – is critical for just-in-time learning.

- From working at one scale to working up and down the scale
  Traditional institutions of learning are almost similar in one particular scale of large lecture halls and small seminar rooms. In the new learning ecology, connective technologies will provide opportunities for us to rethink scale. This is the age in which many organisations will leverage on technologies to be both personal and yet able to scale up for the masses.

- From degrees to performance metrics
  Online platforms are becoming avenues for providing feedback and assessment of an individual's skills. More and more companies are hiring based on the assessment

of a person's previous performance or prior experience on a similar or related task. These performance scores are increasingly replacing indicators such as college degrees.

- From grades to continuous feedback mechanisms
  In the world of big data, advanced analytics, and growing reputation markets, assessment of learning is likely to shift from the episodic structured assessments to a continuous feedback mechanism. This mechanism will take into consideration a complex set of factors to enable flexible adaptation and improvements in learning outcomes.

In this digital age, technology is enabling people to think together, where "the creation, dissemination, validation, sharing and re-creation of information are available to all". instead of a one-educator model in a classroom, "social and networked pedagogies grow in prominence". We are in a new paradigm of networked learning communities.

We live in a community of knowledge. In this paradigm what we know is embedded in our network of connections to one another. The capacity to form connections between sources of information, and create more useful information patterns, is required as our society turns from an industrial into a knowledge economy. The future is going to be very different from even a few years ago. We have some insights into what the future holds for lifelong learning – a new technologically-driven learning ecology with learning flows, unstructured collaborative learning, participative pedagogy, just-in-time learning, learner-centred approach, and new forms of assessment and credentialing.

There is the power of the technology to harness collective wisdom and also the power to create a personal learning environment where the management of learning moves from the institution to the learner, where learning is not about consuming content but about producing new content.

We are moving into what is described as e-learning 2.0. O'Hear (2006) in his article "E-Learning 2.0: How web technologies are shaping education" wrote that

> *"… the traditional approach to e-learning… tends to be structured around courses, timetables and testing. That is an approach that is too often driven by the needs of the institution rather than the individual learner. In contrast e-learning 2.0 takes a 'small pieces loosely joined' approach that combines the use of discrete but complementary tools and web services such as blogs, wikis and other social software to support the creation of adhoc learning communities."*

Conclusion

Conceptual clarity or not, lifelong learning is more than just coming back to school to pick up stackable credits. There is a meta-narrative to lifelong learning, one that is only beginning to unravel. Lifelong learning is central to social development at the macro level (national), meso (industries), and microlevel (individual). It is as important to economic transformation as it is to social development and personal growth.

The Singapore SkillsFuture movement launched in 2015 was explicit that lifelong learning underpins the opportunities for Singaporeans to develop their fullest potential throughout life. It hopes to instil the spirit of learning in the people. Perhaps it has found relevance in Delor's Four Pillars – creating a nation prepared for a knowledge economy, with citizens who are self-directed and equipped with the right skills and competences, and a society which is cohesive and resilient.

Minister Tharman Shanmugaratnam, chairman of the SkillsFuture Council, described SUSS (then UniSIM) as *"a leader in the field of lifelong learning"* and exhorted us to *"play a major role in Singapore, not just in our education system but also in developing our society and its people"*.

What does it mean to be a university for lifelong learning and a leader in the field?

Undoubtedly it means that we have to be at the forefront of the lifelong learning movement, respond to new ways of knowing, and accommodate new changes and new paradigms.

We, as an institution, should embrace and engage in lifelong learning ourselves.

Chapter 24

Fulfilling Aspirations: An Open Invitation

CHEONG Hee Kiat

Young children are a joy to watch, whether at play or being engaged in any sort of activity. Just the other day, when I was writing this, I had the chance to observe a toddler. In her mother's arms, she turned her head time and again as she observed her surroundings, and her face lit up whenever she saw something that piqued her interest, at times even recognising and mimicking that which had caught her eye. She was displaying the most innate and universal of human qualities: curiosity. It is something that every child possesses – a natural gift that enables her to learn and grow. Sadly, as the child grows and matures into adulthood, her curiosity and passion for inquiry will most likely diminish as other priorities distract her from objects of wonder.

It is only human to be curious. Learning begins when one desires to discover something new, to be able to understand additional information and synthesize it with existing knowledge. It is also human to learn and make use of knowledge to make sense of the world we live in. I argue, however, that we have developed a myopic view of learning, one that is tethered to the pursuit of qualifications, career success, social status, and financial security. Surely there is more to learning than this? This limited conceptualisation restricts our thirst for, and appreciation of, learning. What we should have is an expansive view of learning, one that encompasses the benefits already mentioned and so much more. We should relish learning for staying relevant, acquiring and deepening skills, and benefitting society. We should learn to achieve greater self-awareness, growth in body, mind and spirit and to broaden our horizons. Most of all, we should wish to learn in order to live a happy and fulfilling life.

Many of us also mistakenly view learning as something reserved mostly for the young. The reality is that learning is a lifelong pursuit. Aspirations and learning endeavours are often put on hold when we prioritise work and family commitments. We ought to treat learning as a journey throughout life; it is as regular and natural as breathing. As our circumstances change, our learning needs and patterns change, and so do our aspirations for learning. Though stages of the learning journey may come to an end, learning is not a terminal activity. Individual learning objectives may wax and then wane, only to re-appear in another life phase. A single objective may be fulfilled by different activities or by a single learning activity. The learning landscape is dynamic, yet the process itself never stops.

Learning is not constrained by time or space. Nor is it constrained by age, socio-economic status, intellectual ability, life stage, or cultural background. And, it is certainly not confined to the classroom or some form of formal activity. Everyone can learn, and every day presents an opportunity to learn, be it on a formal or informal basis. Unknowingly, we are already learning in many of our daily activities; we hone our skills and complete our tasks more effectively through sound decision-making, engaging with feedback, research, and interactions with our peers. And, because learning is so universal, we must leverage the capacity of learning to drive positive social change. This can be done, but only if we have the learning spirit and habit.

Today, there are many things that can make learning easier. Information is readily available and easily accessed while personal communication devices have made mobile learning a user-friendly reality. Knowledge providers have brought to market all sorts of software and applications that facilitate learning. Team learning is more readily enabled through affordable and easy connectivity. In short, rapid technological advancement is making learning more personalised, easier, and more enjoyable. In Singapore, learning is made even more accessible with SkillsFuture, a national movement that promotes continuous learning, and offers financial support to learners enrolled in various accredited programmes.

Although learning is ultimately an individual attainment, it should also be considered a partnership. This manifests in several ways. For one, there is a partnership between the learner and the learning material, as well as with educators and technologists who devise the pedagogy and the methods of implementation. There are partnerships among learners, and between learners and facilitators. There are collaborations between organisations that join hands in promoting and providing learning, and encouraging their constituents to learn. There are also partnerships between the learner and technology. In the near future, technology will, as a standard feature, enable intelligent learning systems to actively engage

the learner, use artificial intelligence and analytics to direct his or her pace and level of learning, individualise effort and outcomes, and predict the modality and methods that maximise success. Through technology, all of the aforementioned learning partnerships will become more sophisticated and more enriching.

Since its inception, the Singapore University of Social Sciences (SUSS), and its predecessor institution SIM University (UniSIM), have been providing opportunities for lifelong learning to adults of all ages, enabling them to upgrade their skills and qualifications. We are cognizant of all the factors and developments mentioned earlier, and have brought them to bear on our learning systems. Providing education for working adults is our forte, and we are continually enhancing our methods and approaches to provide the ideal environment and impetus for effective, personalised learning. We aim to make learning an enriching and enjoyable experience for our students, conducted on an anytime, anywhere, any-pace basis. We also strive to offer a selection of bite-size courses and whole programmes that are driven by appropriate pedagogy, and aided by artificial intelligence and predictive learning analytics.

In the future, our system will enable even more individuals to find the joy of learning, those who, hitherto, had not actively engaged in continuous learning or who had limited access to this activity, such as those staying in remote locations. Maybe, even those on a trip to Mars can learn just as effectively as those closer to home. Ours will be an integrated system offering one-stop access to learning and the world of knowledge. Added to this, as the chapters in this book illustrate, are the rich and diverse offerings that our faculty bring to an SUSS education. Their reflections in their domains of expertise provide substantive foundations for a strong partnership between learners and SUSS, and give readers an idea of what can be expected by our learners. And, as we form these links, we have the aspiration to make higher education accessible to all. Ours is an inclusive philosophy, one that enables people to continue their learning journey at entry and exit points that best suit them, and allows them to progress in a step-by-step, stackable route, looping in and out of learning as the need or interest arises.

So, join us in this learning journey! Let curiosity get the better of you. Fulfil your aspirations and, perhaps, expand them as you discover more of the benefits and joy of learning. A fulfilment of your aspirations will help to fulfil ours, as SUSS enables more and more individuals to learn, upskill, and better themselves. Join us, as individuals or organisations, to promote this culture of learning. Together, we can advocate more and better learning in others, and share our positive experiences to encourage those around us. We hope our efforts will contribute to building a pervasive culture of learning in our society. This will be the most satisfying achievement of all.

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