CHAPTER 10

Towards Sustainable Development — The Role of Universities in Lifelong Education

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In this era of globalization and rapid change, the notion that a university is a place solely to get a degree will, in time, be superseded by a realization that even after graduating from university, none of us can afford to stop learning. The learning profile and needs of society have fundamentally changed, and this will impact the education model and delivery of universities across the world.

TRADITIONAL UNIVERSITY EDUCATION

Universities are set up as academic institutions with powers to award degree qualifications. University education in many countries has broadly evolved from either the British model of early and deep specialization, or the American model which favours a broad-based approach to learning. Higher education institutions in both countries are recognized for their high quality and excellent learning environment; both countries have produced the world's best universities that consistently dominate the major university ranking tables.

There are however distinct differences between the two models: the British higher education model is characterized by a tutorial mode of learning, subject specification and a focus on independent study, whereas the American model offers a broad and general education covering a variety of subjects

(often delivered through a core curriculum), with flexibility to choose (or change) majors in the senior years. Both education models have traditionally been degree-centric; universities are organized by departments, both to pursue disciplinary research excellence and to plan and deliver degree majors, minors or programs.

Universities award degrees. Concomitantly, stakeholders tend to evaluate the performance of universities in education using indicators that are degree-centric. Government agencies, for example, assess publicly funded universities on measures such as attrition rates, average time to degree, graduate employment rates, graduate starting salaries, student satisfaction with their degree course and learning environment, and so on.

But fundamentally, the role of universities in education is to develop people. A university education imparts knowledge, skills and attributes so that people can lead productive and meaningful lives, and contribute to society and the economy. Although the traditional model of university education is a degree-centric one, this will in time to come, shift to also encompass lifelong learning.

WHY LIFELONG LEARNING?

What is the impetus for lifelong learning in universities? There are a few irreversible forces at hand.

We are now living in the fourth industrial revolution, marked by emerging technology breakthroughs in a number of fields that include robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, 3D printing and fully autonomous vehicles. Klaus Schwab describes how this fourth industrial revolution is fundamentally different from the previous three, which were characterized mainly by advances in technology. The underlying basis for the fourth industrial revolution lies in advances in communication and connectivity never witnessed before. These advances and technological developments are disrupting almost every industry in every country, heralding the transformation of entire systems of production, management and governance. (World Economic Forum, 2016)

Evidently, there will be many sweeping changes to economies, industries and structures, affecting jobs and the nature of work. Technological, product and business cycles are observed to be shorter and sharper, and any change in this globalized and increasing interconnected world will permeate through borders and ripple out quickly. No place is spared from change.

For most individuals, the days of a single, stable career and retiring with a good pension are over. (Being academics, sometimes we may not be cognizant that the safety of a tenured academic career does not extend to other employment sectors.) According to the Bureau of Labor Statistics, (Marker,

2015) the average worker currently holds ten different jobs before age 40, and this number is projected to grow. Forrester Research (Marker, 2015) predicts that today's youngest workers will hold 12 to 15 jobs in their lifetime. Universities thus need to shift from preparing students for a career of a lifetime to a lifetime of careers.

There are also demographic trends at play. With an increase in global life expectancy, we will also be spending longer years in the workforce. In general, people are not saving enough, whether on their own or through voluntary retirement schemes (World Economic Forum, 2018). Coupled with a low-interest-rate environment and reduction in state pension provisions, it is difficult to achieve retirement adequacy early and people cannot afford to stop working. A *Washington Post* article (*Washington Post*, 2017) notes that in America, people are living longer, more expensive lives, often without much of a safety net. As a result, record numbers of Americans older than 65 are working — now nearly 1 in 5. In Singapore, in view of the aging population and low birth dates, the minimum retirement age has been raised from 55 to 62 years old. From July 2017, the re-employment age has also been raised from 65 to 67; employers must offer re-employment to eligible employees who turn 62, up to the age of 67. (Ministry of Manpower, 2018) This provides older workers with more opportunities to work longer and to support themselves.

We are also witnessing the rise of new work models such as self-employment, freelancing and remote work. For example, technological advances that directly connect buyers and service providers have enabled the gig economy to expand greatly in the past decade. The share of the US workforce in the gig economy rose from 10% in 2005 to nearly 16% in 2015. (NACo, 2017) These new work models are not employer-based; instead of relying on employers to provide continuous training and upgrading, individuals will now have to proactively take responsibility and ownership of their skills development.

The need to continually retool and reskill is already acutely felt by those in the workforce. At least 1 in 4 workers in OECD countries is reporting a skills mismatch with regards to the skills demanded by their current jobs. (World Economic Forum, 2017).

All these point towards the growing need for lifelong learning. It will no longer be possible to frontload and compress education into a four-year undergraduate degree program as, unfortunately, and, perhaps embarrassingly, we do not know much about tomorrow's jobs.

From a societal point of view, there is an impetus for universities to play a greater role in meeting lifelong learning needs. Beyond credentialing and facilitating labour mobility, *The Economist* (*The Economist*, 2017a) has warned that when education fails to keep pace with technology, the result

is inequality. Without the skills to stay useful as innovations arrive, workers suffer, and if enough of them fall behind, society starts to fall apart. This is a scenario societies would want to avoid.

HOW ARE UNIVERSITIES RESPONDING?

The need for individuals to engage in lifelong learning throughout their careers is clear. But a World Economic Forum report has found that while the skills required for most jobs are evolving rapidly, adult education and training systems are however lagging behind (World Economic Forum, 2017). How universities, given their existing structures, can and will evolve to become effective providers of lifelong learning education, is not as straightforward.

The market is responding and innovating to enable workers to learn (often times while working) in new ways. Online offerings are making it easier for professionals to upskill or to learn new skills. Massive Open Online Courses (MOOCs) are typically self-pacing and allow employees to pursue academic interests in a way that fits their work and personal schedules. To assess and validate student progress, some MOOC providers administer periodic tests and charge for the award of credentials. Some universities now allow certain validated MOOCs to contribute credits to their degree program requirements.

But online learning is not without its challenges. Only a small percentage of enrollees complete their course. Notwithstanding, online learning has opened up a world of opportunities for both students and content providers. Some herald MOOCs as the greatest leap for education access. Given the large number of users, the absolute reach and impact of MOOCs are significant. One can now access courses offered by Harvard University or MIT, from anywhere around the world.

Some universities have started launching their full-fledged courses online. Georgia Tech's MOOC-inspired online master of science in computer science is a strikingly successful example. Tuition was set at US$6,630, about a sixth of the cost of an on-campus degree. The online course enrolment increased to 6,365 in Spring 2018, making it the largest master's degree program in computer science in the US and likely the world. (Inside Digital Learning, 2018) A single master's program from Georgia Tech substantially expanded the annual output of Computer Science masters graduates in the US.

Other educational market innovations include new ways of connecting education and employment. Udacity has launched a series of nanodegrees in technology-focused courses, designed in partnership with employers. General Assembly, a private, for-profit education organization founded in 2011, has campuses in countries throughout the world to teach entrepreneurs and business professionals practical technology skills. The company's curriculum is based on conversations with employers about the skills they are critically

short of. It holds events where hiring organizations can see the coding work done by its students. General Assembly measures its success by how many of its graduates get a paid, permanent, full-time job in their desired field.

PREPARING STUDENTS FOR LIFELONG LEARNING

In this discussion on how universities can play a role in meeting society's lifelong learning needs, perhaps the most exigent and relevant task at hand is to equip and nurture existing students with the capacities, aptitude and attitudes that will allow them to engage in lifelong learning. This necessitates a critical stocktake of the undergraduate curriculum structure — it goes beyond obtaining a right balance of breadth and depth — and it entails curating a curriculum that hones future-ready skills and traits.

In curricular design, it may be instructive to note that a 2015 study by the Hoover Institution (Hoover, 2015) has found that people with a vocational education are more likely than those with a general education to withdraw from the labour force as they age. This pattern has been observed in countries that rely heavily on apprenticeship schemes like Denmark, Germany and Switzerland. This study has led some to conclude that people with specialized training may be less adaptable, and that a university education cannot solely be for the purpose of helping graduates to find work immediately, without consideration of helping people to adapt to change in the workplace. Universities must thus be careful about disciplinary or vocational over-specialization, and pay greater attention to helping students to adapt to a future of change.

Possibly for similar concerns, British institutions are often criticized for early over-specialization. The 1997 National Committee of Inquiry into Higher Education commissioned by the UK government recommended for all higher education institutions to work to achieve "a better balance between breadth and depth across programmes than currently exists". (Times Higher Education, 2010)

Breadth in the university experience is an important aspect that helps develop the capacity of an individual to learn, unlearn and relearn. Proponents of liberal arts education argue that broad perspectives are the best preparation for multiple career paths in a changing world. A liberal arts education gives students exposure to a broad range of fields. Students learn to work independently and in groups, how to write, express and communicate well, how to analyse, critique and defend arguments using a variety of tools, both quantitative and qualitative.

Strong foundations for lifelong learning cannot be underestimated. Companies like Google and Ernst & Young have cited that learnability

is more important than other traits when recruiting employees (Business Insider, 2016). Eric Schmidt, Executive Chairman of Google, says the company seeks "learning animals", people who are naturally driven to learn on their own. These companies have figured out the key to keeping their teams at peak performance is to choose employees who are predisposed to learn and grow on their own.

As the nature and structure of work are changing, every university will have to review its undergraduate curriculum to chart a course that prepares students for a future of lifelong learning, according to the institution's priorities, structures and resources available. There is no tried and tested magic bullet model to adopt. Some UK institutions have launched new degrees that replicate liberal arts degrees offered in the US. University College London (UCL), for example, launched the Arts and Sciences (BASc) degree in 2012, where students create their own bespoke program incorporating both arts and sciences subjects, and study innovative core modules to enhance the link between disciplines, together with a foreign language and a job internship. (UCL, 2018) This degree programme is pitched at the best students, "those who see themselves as wanting a leadership position". (Times Higher Education, 2010) Other universities have taken the approach that one of the best ways to engage students is to encourage them to ask and explore the "big" questions and how ideas fit together and relate to life. The London School of Economics and Political Science (LSE) introduced a compulsory flagship and award-winning interdisciplinary course, called LSE100: The LSE Course, that aims to support the development of intellectual breadth. LSE100 uses important issues of public debate to motivate investigations of research methods and the need for academic thinking. Contrasting disciplinary approaches are examined in the small weekly classes, where students investigate the methodological choices underlying different approaches (LSE, 2013).

At NUS (National University of Singapore), the educational model that we had adopted several years ago was based on building "T"-shaped competencies. The vertical part of the "T" refers to a major or specialization that a student would need to learn in-depth knowledge; the horizontal part of the "T" refers to broad-based learning. To ensure that our students have strong foundations, we now need a thicker and broader horizontal base. Our students must now learn statistics, quantitative reasoning and computational thinking as knowledge in these areas is very critical for emerging areas of artificial intelligence and data analytics. This very "thick" layer of general education at NUS has been reinforced with many more of the new skills that we feel all our students would need to have when they go out into the working world, such as global orientation and adaptability, and industry experience. About two-thirds of our students go on internships.

Beyond writing and numerical skills, the horizontal component must also infuse future-ready skills that cannot be easily replaced by automation or robots. Social skills, which universities traditionally are not involved in, are an example. David Deming (Deming, 2017) has written about the growing importance of social skills in the labour market. Since 1980, growth in employment and pay has been fastest in professions that put a high premium on social skills. There is value in the ability to manage relationships well; people who can effectively negotiate the division of tasks between coworkers form more productive teams. If work in future will increasingly be done by contractors and freelancers, then the capacity for co-operation and negotiation will become even more important. At NUS, we have developed a "Roots & Wings" program which is now in version 2.0. "Roots" refers to personal skillsets like resilience and mindfulness and "Wings" refers to interpersonal skillsets. Through this program, students learn about empathetic communication and, hopefully, they become more effective when interacting with their peers and leaders in the future workplace.

On disciplinary expertise, NUS is now advising students that a "T" is not good enough; we are encouraging students to read a double "T", which in mathematical notation, is a Pi or π. With a π-shaped competency, one of the majors a student takes at NUS will be in Sciences, Technology, Engineering and Mathematics, or STEM, while the other major will be in the humanities or social sciences. This versatility will give our graduates versatility to skill up in either areas or in a multidisciplinary area, when needed, in the future.

Formal undergraduate programs span four years and, no matter how long you keep them in the university, students are not going to be able to learn everything they need to, because of the rapid rate of change. No university will be able to provide students with all the skills that are going to be needed 20 years down the road. Hence, beyond modifying the undergraduate curriculum to prepare students for a world of change and lifelong learning, universities must gear themselves up to meet the lifelong learning needs of their students, graduates and the community they serve. This represents a shift in thinking of the model of university education, which traditionally, is centered on pre-employment education and training.

CHALLENGES AND OPPORTUNITIES

Will universities be able to respond to the changing and evolving needs of society towards lifelong learning and continuing education?

Lifelong learning is not about accumulating degrees, but engaging in bite-size and timely learning to upgrade and learn specific skills. Yet, it has been said that the model of campuses, tenured faculty and so on does not work

well for short courses. (*The Economist*, 2017b) Traditional university faculty have other priorities in long-term research work, and hence, academic institutions may struggle to deliver fast-moving content. Contrast this with non-academic institutions like Pluralsight, which uses a model similar to that of book publishing; it employs a network of 1,000 experts to produce and refresh its library of videos on IT and creative skills. These experts get royalties based on how often their content is viewed; its highest earner pulled in $2 million last year. Such rewards provide an incentive for authors to keep updating their content. (*The Economist*, 2017b) Universities are, however, not structured along such incentives. Tenured faculty are usually far more concerned (and rightfully so) with achieving breakthroughs in their research area and to build their reputation within the field, than with thinking about the vocational lifelong learning needs of their students.

On a more positive note, technology will bring about many new opportunities for universities to design and deliver lifelong learning programs. With flipped classrooms, constraints such as locality and scheduling no longer exist. Learning of materials can take place offline and physical class sessions can be allocated to discussion and problem-solving. Technology will also allow learning to become increasingly social and interactive. With MOOCs, the institution's potential for scale and reach to new learners is immense.

As lifelong learning course offerings will have to be developed to meet market and industry needs, a shift to engage in lifelong learning may bring academic institutions and industry closer, and, through the course of consultation and collaboration, the nexus between research, education and industry can be strengthened in a positive and mutually beneficial way. Industry developments can inform research, and vice-versa; education can be enhanced with industry relevance. Novel modes of industry training and internship may also evolve.

Some universities may opt to segregate lifelong learning and traditional undergraduate degree course offerings. NUS on the other hand, is experimenting with assimilating lifelong learners with undergraduate and postgraduate programs, in a mixed classroom setting. We believe that adult lifelong learners can enrich the classroom experience as they bring with them valuable life and career experiences and mature perspectives; lifelong learners bring an opportunity for diversity and cross-learning in the classroom.

So far, no traditional research-intensive university is engaged in lifelong learning in a concerted and comprehensive way, or as a core mission. NUS is perhaps bold and innovative in this regard, as our institution aims to be an important lifelong learning institution in Singapore and the region. In 2018, NUS initiated a Lifelong Learners' program, which is the first in any university around the world, where all NUS graduates will enjoy automatic enrolment into all of our continuing education programs for 20 years. By

2020, NUS is aiming to offer 20,000 continuing education places annually, and this can potentially benefit our nearly 300,000 alumni. The range of courses and modules will be comprehensive, but there will be an emphasis on offering skills-based industry-relevant programs.

In conclusion, lifelong learning presents tremendous opportunities for traditional research-intensive universities to contribute directly to a growing and pressing societal and economic need. While universities are evolving to become more engaged in lifelong learning, whether it be through dedicated continuing education units, or experimenting with Coursera and other MOOCs, or innovating their own models, we need to acknowledge that anticipating future trends, embodying the mindset of lifelong learning, and providing access to lifelong learning demands a complex system involving multiple stakeholders. This goes beyond universities extending the reach of their programs from being front-loaded on undergraduates to delivering educational options to students of all ages. A whole ecosystem comprising governments helping citizens to understand future job markets and the skills they will require, and financial incentives to support skills upgrading, employers that create work environments that support lifelong learning, are all necessary to bring about this societal shift to stay relevant and competitive through lifelong learning.

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