

Chapter 2

Learn, Innovate and Prosper- A Perspective on Learning Cities

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Abstract This chapter will consider the shifts in the world economy and the implications for change in Europe. The need to develop a highly skilled knowledge economy requires the development of entrepreneurial behaviours, attitudes and skills in the working population. It is recognised that advanced technological developments are central to regeneration of the economy. The chapter describes the attributes necessary to climb the global economic hierarchy and suggests interventions to improve outcomes. The Alacrity Programme is provided as an example of the kind of support that has been developed and proven to be effective.

A Perspective on Learning Cities

In economic terms, the world is being turned on its head. By 2013, only 32.7% of the global economic output of G-7 was from the G-7 countries (Federal Statistical Office of Germany 2015: 8). As developing countries educate, innovate and mobilise, their economic performance will push European economies out of the G-7 and, although a number of European countries will stay in the G-20 group of nations, they are left in the dust compared to the new entrants.

Knowledge economies typically develop and manage six strands of economic development: ideas, skills, access to capital, equitable taxation, infrastructure and opportunity capture. Development and the commercialisation of ideas come from a combination of educational establishments, industry and the general population. Around the world, many universities engage in research activity but struggle to commercialise ideas due to a system that rewards publication rather than commercialisation and wealth creation. In many economies, there is a challenging imbalance between funding for research in higher education and commercial outputs.

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Intellectual property has been a point of contention between academia and investors. The focus of angst is usually valuation. Interestingly, universities that take a more liberal view of IP generated within their institution are attracting more venture capital support and generating greater outputs.

As universities create cross-disciplinary space between academics, industrialists and graduates, the commercial success rates typically increase. Universities are increasingly co-locating Business Schools with Science and Engineering Schools, whilst also encouraging serendipity. A knowledge economy has an insatiable appetite for skills. The explosive growth of the Internet of Things, cyber security, social media and mobile applications has created a global deficit of software engineers with the skills necessary to exploit the opportunities. Nations teaching software-coding skills throughout the school curriculum are increasingly improving economic performance.

To create companies with global impact, entrepreneurs need access to capital in all its guises. To encourage the flow of funds, governments have the capacity to provide incentives through taxation structures that provide benefits to both investors and founders/employees. A government providing incentives to knowledge-based companies can quickly realise a return on their tax concessions. The largest expense in knowledge businesses is work force, in the form of salaries. These salaries are subject to payroll taxes and insurance payments from the outset of a company's operations. Furthermore, as companies mature and become profitable they also return revenue to the National Treasury through corporation and sales taxes. Research and development grants, where available, are popular, as they assist in innovation whilst having no dilutive effect on shareholder ownership.

According to Atomico (2016), two hundred and thirty six global companies have reached more than \$1 billion in valuation over the last thirteen years. It is noteworthy that most of them are based on products and services created through software engineering. These companies have created their value by harnessing the Internet and its users. Due to the low barriers to entry, knowledge companies can create wealth rapidly through a combination of human capital, low-cost computing and network access. In a very short period of time, companies with less than fifty people have created 'over-the-top services' which bypass traditional service providers and deliver benefits to hundreds of millions of people. Who could have imagined that the world's largest hospitality company, Airbnb, would not own a single property, or likewise, the biggest taxi company, Uber, would not own a single vehicle? In some instances, their disruptive innovations have transformed appetites and markets. The opportunities have never been greater nor the barriers lower, yet, despite this, many economies struggle to create companies with such valuations. What is consistent about the geographical spread of this success is empowering infrastructure and access to skilled workers.

In many countries around the world, administrators were lobbied and persuaded that the future of ICT was centred around the use of a single proprietary business application. Students would be taught to use a word processor, a spreadsheet, a simple database and a presentation tool. This was generally done as a substitute for learning basic software programming skills and the fundamental workings of digital

platforms. This approach resulted in proficiencies associated with mass digital literacy being subsequently lost for twenty years. A generation of ‘user students’ were fashioned who have little concept of how software is created or implemented. Now there is a burgeoning realisation that this has been a mistake, leaving a gaping hole in both the workforce and teaching skills, which is proving challenging to overcome.

The world is generating data at an unprecedented rate, and a name now describes the phenomenon. ‘Big Data’ is changing the way we look at ourselves and our world. Ninety per cent of the world’s data have been generated in the last twenty-four months, and in 2016, digital data will grow to eight Zettabytes (eight Zettabytes is the equivalent of giving each person on earth 80,000 books, in terms of capacity). If you consider the world’s five biggest companies, three of them are computing platform providers whose services did not exist a decade ago.

The Internet of Things means that almost everything organic and inorganic can be connected to the network. Everything from our bodies to our light bulbs can generate data in volumes that were unimaginable just a decade ago, but big data requires a big network bandwidth. Nations that have understood the need for ubiquitous bandwidth and connectivity are establishing a platform to capitalise on the opportunities that arise from this new cornucopia of information.

Cloud computing has enabled the hosting of advanced services that previously were only available to large corporations. Small businesses can benefit from all of the capabilities of advanced applications and contact centres without purchasing expensive enterprise equipment or hiring in-house expertise. The services and computing platforms are hosted in a data centre and accessed from any location or jurisdiction. To access these new services, citizens, companies, schools and government agencies require symmetrical network access as data are now required to flow quickly in both directions. This is a departure from the original architecture of the Internet designed to populate web pages and download media. It is hard to predict the future in such a fast moving environment, but one thing is certain, the requirement for connectivity and computing platforms are prerequisites for exploiting it.

Opportunity capture is realised by utilising all the strands of economic development: ideas are developed by skilful people who, in turn, are rewarded for their efforts, find access to capital and are supported by a connected infrastructure. Serendipity plays a role in successful innovation. The probability of success is enlarged by creating meeting places in cities, campuses, clusters or online, where persons with multidisciplinary roles can exchange ideas and vision. As entrepreneurs develop their concepts, they have to balance their desire to supply their notions with the actual needs of their customers. Ideas can be intoxicating and entrepreneurs can often find themselves martyrs to their ideas. If the entrepreneur’s idea was wrong from the outset, then no amount of self-delusion will change that fact. This dilemma is avoided by constantly communicating with customers. By simply asking a couple of very simple questions—‘What do you need?’ and ‘What do you want?’—many mistakes can be avoided. Strangely, start-ups often go into stealth mode; obsessed with their ideas and divorced from the very people they

want as customers. It is always better to build something customers want, rather than building something you want.

The Internet has provided a portal to the world, its people, their devices and systems. In all the information generated by the Web, mining of Big Data is creating fertile ground for new ways of delivering services and efficiencies in the discovery of new science and the management of existing global resources. As mobile devices have supplanted the desktop computer, the scope of the marketplace has enlarged and its reach widened. Big Data is as easily accessed and interpreted by SMEs (small and medium-sized enterprises) as it is by global corporations. In fact, it is often the SME that has the intuition necessary to innovate and develop new intelligence and value.

Learning Cities by their very name imply teaching. Yet teaching excellence can fall victim in a push for research excellence, particularly in universities that constantly contend resources between teaching and research capabilities. In the knowledge economy, there are huge opportunities to improve teaching methods and outcomes. In many subjects, the lecture room is seriously threatened by online tools delivering more engaging content and inviting application of learning concepts rather than simply generating essays. Pedagogical methods, where a student applies his or her learning 'in the moment', will often drive outcomes that are more efficacious. Such pedagogy is suited to the personalised experience of a well-designed and well-connected computer-learning environment, as opposed to the diode effect created within a lecture hall. The better virtual learning environments maintain an intimate relationship with the student, as a teacher using them can monitor understanding and competence.

The ability to interconnect teacher to teacher, student to student and student to teacher, enables a greater level of collaboration, interaction and understanding. Virtual learning environments are more than simply posting teaching schedules and course content online. The better examples demonstrate faster routes to mastery and increased levels of student satisfaction. The advantage of a distributed learning model is the ability to reach out to other parties in the economy. Industry has huge potential to increase levels of engagement and mentoring with learning institutions by being included and connected to the emerging learning environments.

The Alacrity Foundation

An example of joining the strands of economic development together in an attempt to create a new generation of technology companies is the Alacrity Foundation, based in Wales. Alacrity is an initiative born out of a partnership between the Welsh Government, private philanthropists and investors.

As an educational charity, the Alacrity Foundation provides one-year post-graduate education in commercialisation and entrepreneurship. The Alacrity curriculum is designed to empower young graduates to form and manage successful high-tech companies. The curriculum process is complemented by volunteer

professional mentors teaching everything from public speaking to listing a public company. The mentors also provide coaching for burgeoning businesses. Stephen Spielberg, the film producer, is famously quoted as saying: ‘The delicate balance of mentoring someone is not creating them in your own image, but giving them the opportunity to create themselves’.

Unlike many entrepreneurship incubators, Alacrity does not ask graduates to come to the programme with an idea. The focus of the methodology is totally demand driven. The ideas for a business are sourced from large companies that agree to work with the Foundation as Strategic Partners. The graduate teams are directed to create solutions to real problems, that once developed can be distributed through the sales channels of the Strategic Partners.

This method of assisting corporate innovation is timely. Innovation processes are being pressured by increasing levels of risk management and compliance. Innovation, by its very nature, involves risk often beyond the appetite of management and shareholder groups. For Corporate Partners, the liberation of ideas and opportunities outside the restrictive environment of the corporate structure allows innovation to move at the pace of a start-up with its free-thinking, energetic and hard-working attributes. An additional benefit for the Partner is that product and service development costs are met elsewhere whilst still being able to introduce innovations to their customer base.

The Alacrity graduate team is free to choose their particular project from a number of opportunities. They are allowed, in fact encouraged, to pivot to find the optimum opportunity. The goal of each team of graduates, which is typically four in number, is to develop a product or service to the stage of a Minimum Viable Product. In order to graduate successfully from the programme, each team needs three things to be in place. Firstly, they must have a verified product or service, a product with clear pent-up demand in the marketplace. Secondly, each team must have customers in place, and finally, they need to identify a sustainable revenue stream. These characteristics are important as most start-up failures are defined by their absence.

It makes little sense to educate and align start-up companies and then leave them to fund themselves in an environment that is extremely crowded with thousands of people looking for support. In such conditions, investment terms are typically harsh and weighted heavily in favour of the investor. To overcome these concerns, at graduation each team can draw down up to £250,000 of venture capital, if it can prove it has a viable product/service, customer base and a revenue stream. This equity funding is made available by a specialist venture Seed Fund formed by a combination of public and private investors. The Seed Fund is separate from the Charitable Foundation but formed with the express purpose of supporting Alacrity conceived companies.

In this scenario, investors enjoy the benefits and characteristics of a later-stage venture round but with all the value of a seed round. The investors are not simply funding a concept but developing a business with growing revenue streams. It also spares the new company from losing momentum by having to spend months trying to raise financing. Alacrity’s task is to make sure the teams have access to capital,

access to contracting opportunities, and the help, advice and mentoring that they need to go out and be successful.

Through the establishment of the Alacrity Foundation and its dialogue with employers, it became clear there is a need in the marketplace for ‘work-ready software engineers’, not simply engineers with a theoretical understanding of software and computing. To address this issue, Wales has created a National Software Academy with a clear and unambiguous purpose: to produce the best software-coding graduates for industry and fulfil the increasing software programming needs of the National Economy. The Academy offers undergraduate courses in computer science, always fully aligned with projects and challenges from industry. The curriculum reflects the real needs of employers and the economy to provide a high level of applied learning. As subjects are taught, the newly acquired knowledge is applied immediately. It is a good example of the aforementioned teaching methods ensuring students apply their learning within 20 min of being taught. As these methods are perfected, they are fed into the wider educational landscape to improve the school curriculum and national digital competences across all subjects taught.

We all want to be in economies that are creative, innovative and wealthy. Where the focus is on quality of life and where the population is made up of people who collectively have independence and self-confidence and can make long-term choices about the kind of future they and their children will experience. This is where environmental sustainability, intergenerational progress and social responsibility come to the fore.

Prosperity can only be sustained by making fundamental changes to the way we educate and mobilise ourselves and more particularly our young people. For nations and regions that simply choose to copy what others have done and do it cheaper, are operating in ‘Hindsight’ mode, resulting in a competitive advantage built upon cost, resulting in survival subsistence. Any regional capabilities are constantly threatened by the next low-cost regions appearing over the horizon. To improve performance, a region can endeavour to develop production efficiencies based on value, a combination of quality and cost. This typically is the first sign of sustainability and wealth.

More highly developed economies succeed in creating value through ‘Insight’. Looking ‘in the moment’ and creating innovation systems to take advantage of new trends and opportunities. This paradigm reflects much of the so-called developed world and results in sustainable economic development. The most successful knowledge economies and regions differentiate themselves with ‘Foresight’. They are knowledge-based clusters attracting the brightest and best talent from across the world, drawn by the prospect of creating the future. They successfully nurture an innovation culture, develop global leadership positions and enjoy the highest standards of living and sustainability.

The ability to create economic foresight requires a learning environment that not only understands the past but can also interpret the present and has the skills and intuition to predict the future. Such innovation habitats all have the six aforementioned economic strands driving their acceleration, but in every case the

ECONOMIC HIERARCHY					
ROLE	ANY JOB	LOW END MANUFACTURING	HIGH END MANUFACTURING	VALUE ADDED MANUFACTURING	INNOVATION PLUS
PLAYER	UNDER DEVELOPED REGIONS		LESSER "DEVELOPED" REGIONS		KNOWLEDGE ECONOMIES
STRATEGY	COPY		PRODUCTION EFFICIENCY		GLOBAL LEADERS
COMPETITIVE ADVANTAGE	COST		QUALITY & COST (VALUE)		FORESIGHT INNOVATIONS SYSTEMS CULTURE
OUTCOME	SURVIVAL		WEALTH		QUALITY OF LIFE

Fig. 2.1 Hierarchy of economic momentum

bedrock of their continuing prosperity is the drive for excellence in education and research coupled with an insatiable drive towards discovery and innovation, where innovation is defined as the useful embodiment of ideas in society (Fig. 2.1).

So what are the prerequisites to this innovation habitat? There needs to be a societal and political imperative to make it happen, which requires a consensus towards the investment necessary to achieve the desired outcomes. This might seem obvious, but many regions espouse a rich narrative of economic change, but support their ambitions with meagre resources and somehow hope that a new world can be created using old-world methodologies. Whenever educational reform is discussed an immediate and ubiquitous cry for cash resounds throughout the halls of government and although budget is a key factor in reform, simply throwing cash at a broken system can never produce an effective improvement in educational and economic performance. So how can a system do more with less? How can our Learning Cities be optimised to produce economies that are creative, innovative and wealthy?

Here are some suggestions:

- Ponder and understand the concept of being ‘work ready’ in the knowledge economy.
- More people in industry getting more involved in education.
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- Stop smothering vocational training with a deep theoretical mist.
- Better understand how to commercialise and liberate ideas more effectively.
- Encourage greater creativity and independent thought in our children.
- Control the forces of governance, compliance and risk management from stifling early innovation.
- Ensure that the nation’s taxation system incentivises learning, patent protection, risk, long-term commitment and success.
- Provide our young people with positive role models
- Deliver global connectivity, connecting more excellent teachers with students in any location.
- Build appealing social-learning networks and blended teaching platforms.

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