HIGHER EDUCATION STUDY TOUR TO UNITED STATES AND CANADA

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Universities play a significant role in shaping economies and societies, and their role is even more critical as countries trade increasingly on knowledge and intellectual capital. Higher education has a particularly important role to play in equipping learners, businesses and communities to participate fully in a digital economy. This involves more than simply imparting disciplinary knowledge and the capacity to think, but building competencies in areas such as digital literacy, problem solving and collaborative discovery. The contemporary university is now expected to be integrated more closely with industry, provide learners with access to available tools and do all of this with less government funding. The business models, pedagogies and infrastructure that have served universities well to date are now under pressure. In 2013 incremental improvement may not be enough.

Universities visited on the study tour acknowledged that the higher demands on universities – coupled with the disruption caused by Massive Open Online Courses (MOOCs) – is forcing a re-think of some of the fundamental tenets of university operations. It is causing university leaders to ask questions such as:

- How do universities remain relevant in the face of such change?
- What opportunities exist to increase throughput/drive efficiencies as traditional revenue sources dry up?
- How does a university differentiate if not by its content?
- Where will future demand come from when being ‘local’ is no longer a major competitive advantage?

The 2013 US/Canada Higher Education Study tour – organised around the theme of financially sustainable infrastructure - sought to explore these issues in greater detail, and investigate potential responses.

Format of the tour

Three executive briefing centre visits

Universities that participated in the study tour

- Cisco
- Citrix
- NetApp
- University of Melbouerne
- Flinders University
- Curtin University
- ECU
- Deakin University
- The University of Adelaide
02 Expectations of universities are changing in fundamental ways

In assessing how universities are changing, it is important to understand why.

**Learner** demands are increasing on a range of fronts, including an expectation that universities will equip them for a contemporary workplace not just equip them to think. Learner demands are being fed, at least in part, by the proliferation of consumer technologies, which are creating expectations that learners be able to learn in a manner, and at a time and place that suits them. Increasingly students are also expecting to have an almost infinite choice of subjects.

**Industry** is also more demanding, driven by the pressures it is under from its own customers. In the quest for efficiency and to increase speed to market, industry requires ‘job ready’ graduates that can be immediately productive. They also expect graduates to have high levels of digital literacy, the capacity to problem solve and a degree of comfort with ambiguity to deal with rapid change.

The wider **community** is also more demanding, with universities expected to be accessible to all as part of a move towards ‘mass education’. This insists that universities enable participation of the most disadvantaged in society.

<table>
<thead>
<tr>
<th>Industry expectations</th>
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<tr>
<td>Job ready graduates, including disciplinary knowledge and capabilities such as problem solving and capacity to collaborate</td>
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<tr>
<td>The capacity to retain/skill staff in flexible ways</td>
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<td>Supply of ‘in demand’ skills such as STEM subjects that are drivers of economic growth</td>
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<th>Learner expectations</th>
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<tr>
<td>Individualised learning, including personalised content and the ability to learn at their own pace/place</td>
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<tr>
<td>Access to technology and tools that make the learning experience interactive and in step with their experience as technology ‘consumers’</td>
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<td>Opportunities to collaborate with others</td>
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<th>Community expectations</th>
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<tr>
<td>Opportunities for disadvantaged learners (based on income, ethnicity or disability) in society – ie participate fully in society</td>
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<tr>
<td>Provision of high quality lifelong learning opportunities</td>
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<tr>
<td>Easy community access to the physical (and virtual) infrastructure recognising universities are a public asset</td>
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Changing expectations of universities has forced a ‘re-think’ of the fundamental tenets of higher education. The emergence of MOOCs— in particular— have forced a re-examination of why universities exist and how they must respond. Consider the shifts that are occurring:

<table>
<thead>
<tr>
<th>Historical cornerstones of universities</th>
<th>Contemporary thinking</th>
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<tbody>
<tr>
<td>Content as the primary differentiator</td>
<td>Experience as the primary differentiator</td>
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<tr>
<td>Learning an individual pursuit</td>
<td>Learning as a collaborative experience</td>
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<td>Summative assessment</td>
<td>Formative assessment and intervention</td>
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<td>Learning by listening/reading</td>
<td>Learning by doing</td>
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<tr>
<td>Instructor as subject matter expert</td>
<td>Instructor as facilitator</td>
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<tr>
<td>Learning anchored by the campus</td>
<td>Mobile/unbounded learning</td>
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The radical shifts that are occurring are driven by pressure on university business models, pedagogies and infrastructure.

<table>
<thead>
<tr>
<th>Business models are under pressure because...</th>
<th>Pedagogies are under pressure because...</th>
<th>Infrastructure is under pressure because...</th>
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<tr>
<td>Quality content can be free</td>
<td>Classrooms are flipped</td>
<td>Technology is embedded in learning, and therefore ‘mission critical’</td>
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<tr>
<td>Funding for students is paid on completion</td>
<td>Teachers are facilitators, as well as experts</td>
<td>Students/faculty expect to bring their own devices</td>
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<td>Competitors are now global, and places are demand driven</td>
<td>Learning needs to be adaptive, collaborative and individualised</td>
<td>New channels don’t displace legacy ones: universities need to resource both on and off campus</td>
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<tr>
<td>The value of a university accreditation is being constantly re-evaluated</td>
<td>Learning is multi-channel</td>
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“Managing costs on its own is not enough. You can’t save your way to success.”

LYLE NEVELS, BERKELEY
The physical and virtual ‘classrooms’ are becoming—and will need to become—more integrated.

Blended learning has existed for decades, and for many the response to MOOCs is that nothing has fundamentally changed. However, universities visited as part of the tour suggest that the current focus isn’t just a blend—i.e. a ’bit of each’—but true integration of the virtual and campus experience. True integration involves more than operating multiple delivery channels simultaneously, it means adapting pedagogy to technology.

“Infrastructure has the potential to be a platform for innovation as well as meeting our basic needs”

President Qayoumi

The notion of an integrated campus is causing many to question whether they have the right infrastructure in place. The combination of increased user demand, device proliferation and rising traffic volumes driven by the use of video and rich media are creating significant pressure on legacy infrastructure. This includes the infrastructure required to deliver, secure and store content, and dealing with big data. Creating a sustainable platform to support the integrated campus experience will require a step change in IT capability for many universities.
The need for integration between the physical and virtual campuses has been accelerated by MOOCs

It is difficult to contemplate the impact of technology on universities without being drawn into a conversation about MOOCs. The study tour delivered a number of consistent observations about MOOCs, most notably that they are not a panacea but they do have a role to play. It was observed that while online learning had existed for decades, the disruptive aspect of MOOCs is the involvement of top ranked universities and fact they are free.

North American universities cautioned against ‘dismissing’ MOOCs too easily as hype. For example, MOOCs had helped to increase focus on the use of learning analytics in general, had caused people to consider how technology can be used to individualise learning and also created some interesting models for the way that formative assessment can be incorporated in face-to-face as well as online environments.

It is perhaps ironic that the attention on MOOCs has focused attention back on the role of the physical campus. For example, it is creating pressure on universities to create more collaborative learning spaces on campus and to exploit new technologies such as video that make the learning experience more engaging. Universities that argue MOOCs ignore the campus experience have been forced to re-evaluate what their own campus experience looks like.

Legislative response to MOOCs

The Californian legislature is considering an Online Education Platform Bill which will force universities to provide a student with access to an online course if demand outstrips supply. The changes were a response to the fact that as little as 16% of Californian students were completing their degree in four years. Once a course is deemed ‘impacted’ – or full – students can access an online version of the course with fully transferable credit.

An executive from Udacity, one of the major private companies involved in MOOCs, described to participants in the study tour how the models were evolving. While there is still interest in online only MOOCs, Udacity is focused on augmenting traditional courses at SJSU and reported that early trials had led to an unexpected spike in on campus attendance, creating additional pressure on the physical campus infrastructure.
How universities are responding

The strategies adopted by universities to achieve financial sustainability will vary significantly. Context is everything in higher education, and the challenges faced by research intensive institutions such as UC Berkeley, Duke and UBC are significantly different to SJSU and Indiana universities. Despite this, there are two priorities being pursued – the creation of value and the controlling of costs:

1. **Create value**
   - Improve learning outcomes and student engagement through more interactive and collaborative learning models
   - Increase the relevance and value of centralised services (including ICT) to faculty members and other university staff
   - Adapt curriculum to respond to industry requirements

2. **Control costs**
   - Take advantage of new technologies such as cloud and virtualisation to change the economics of service delivery
   - Automate appropriate functions
   - Exploit opportunities for shared services and scale economies
   - Focus on asset utilisation including for storage, ensuring infrastructure is optimised
   - Invest in flexible infrastructure that can be scaled up and down with demand
   - Prioritise investment in technologies that manage security risks

Too often, it was reported, the creation of value and control of costs are seen as a choice, when the reality was that universities had to do both. At SJSU, for example, the value creating activities were necessary to increase future revenues. SJSU is contemplating use of more online content and industry internships to both a) improve the student experience and b) increase throughput at the university (on the basis that a student may only need to be physically present on campus for half of their undergraduate degree.)
Creating value through technology

The opportunities presented by technology are immense. It has the potential to create value in a number of ways, most notably in improving the outcomes for and experience of students and faculty members.

The notion of infrastructure as a platform for innovation is potentially profound. Examples on the study tour of infrastructure being used as a platform for innovation included:

- Adoption of a collaboration platform by Duke University to help students and faculty create communities of interest and ultimately improve engagement and results
- Investment in ubiquitous wireless at UBC to improve the student and staff experience
- Integration of video into classrooms at SJSU to increase student engagement and retention
- Virtual desktops at Indiana University to increase the mobility of faculty staff and students
- Tapping innovation by students at Berkeley - including the ‘Course Ninja’ scheduling application created by a student which was ultimately adopted and supported by central IT
- The focus by many universities on capturing big data that can create social and commercial value
- Centralising management of IT for research labs at UBC to provide higher service standards

**Infrastructure as an innovation platform at UBC**

UBC is recognised as a technology leader, and the scale of its infrastructure is immense. UBC has had up to 30,000 simultaneous wireless users on its network, and is currently trialling full Wi-Fi capability in its student accommodation. The response to an explosion in the number and usage of devices led to a doubling of UBC’s wireless access points. But the utility of the technology is not the only focus. UBC is using its infrastructure base to leverage innovative applications for students and faculty staff. Students and staff can get a blog up and running in 10 minutes using a hosted multiuser environment and they can take advantage of a self provisioning Wiki space to collaborate with peers.
Universities are at varying points in the shared services continuum. Australian universities observed that major reform of ICT delivery occurred a decade ago in Australia, driven by cost pressures. As Berkeley acknowledged, a university’s standing and brand does not excise it from cost pressures.

The pursuit of efficiencies have tended to focus on the university’s own ICT spend, including exploiting opportunities around outsourcing, consolidation of duplicate activities, more cost effective platforms (such as cloud) and more active measurement of infrastructure utilisation. One of the areas identified as critical to success was standards, particularly in the creation of enterprise service catalogues. At UBC and Berkeley the focus was on creating an enterprise ‘bus’ to ensure that faculties could adopt technologies that conform to open standards. This approach enables control of a fairly broad — but standardised — set of applications.

Universities acknowledged that the focus needs to be broader than reducing the cost of technology itself, but rather how they can use technology to reduce costs in other parts of their business. Areas include:

- **Improving energy efficiency**: UBC was the first university in the world to sign up to the Kyoto Protocol
- **Increasing student retention**: investments in analytics and an early warning project at UBC are designed to enable earlier detection of disengagement, with clear financial returns given universities are paid on course completions
- **Improving throughput**: SJSU is focused on reducing the time spent physically on campus without compromising the experience
The future: where will it end?

Higher education is at a tipping point. The confluence of new technology, new business models and new pedagogies have the potential to disrupt even the most esteemed institutions. If the past three years are to be predictors of the future, the study tour confirmed that:

- **Everything will be connected**: the Internet of Everything is a term coined to describe the proliferation of networked technologies, beyond devices to consumables such as light bulbs and appliances. 99.4 percent of physical objects that may one day be part of the Internet of Everything are still unconnected.\(^1\)

- **The pace of change will accelerate, rather than slow**: the pace of technology uptake is exponential, not linear. In higher education simply keeping pace with consumer technology will be a challenge particularly if technology is going to be secured, and scalable.

- **Choice for students will increase**: technology will force established institutions to change and create space for new entrants. Students will have more power than before to exercise choice in where, how and at what pace they learn.

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The Notion of the ‘Integrated Campus’ Underpin Three of the 5 Priorities at SJSU

SJSU has 5 priorities – the first 3 directly enabled by technology infrastructure.

1. **Unbounded learning** – continuous innovation in learning
2. **21st Century Spaces** – gathering spaces and up to date facilities
3. **Agility through technology** – improving organisational responsiveness
4. **Spartan pride** – creating a sense of community
5. **Helping and caring** – creating a culture of helping others

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\(^1\) [http://www.cisco.com/web/about/ac776/docs/innov/IoE_Economy.pdf](http://www.cisco.com/web/about/ac776/docs/innov/IoE_Economy.pdf)
10 Implications for institutions

“95% of people talk about innovation, but only 5% of people actually do it. The biggest risk to institutions is no action at all.”

PRESIDENT QAYOUMI

There are some who would argue that higher education is going through an adjustment, rather than a transformation. Others argue – perhaps rightly – that MOOCs are unsustainable without a proven business model.

Participants on the study tour – and institutions that were visited - cautioned against under-estimating the scale of disruption and the innovation required to respond. To attribute the current disruption to MOOCs alone is to potentially miss the point. Participants on the study tour suggested that the most important aspect of MOOCs was that they had caused universities to ask fundamental questions about why they exist, the value they create and how they operate. The answers to these questions will impact on institutions in different ways, but will occur on at least three fronts:

1. Financial. Universities will be under pressure on the demand and supply side. Creating value often involves investment, which is antithetical to a cost reduction focus. The notion of ‘doing both’ – creating value and reducing costs - will challenge universities to prioritise investment in only the most strategic infrastructure and take advantage of ‘technology as a service’ for the remainder.

2. People. Shifting to new pedagogies and an integrated campus will challenge faculty staff and administrators alike. People will need to be convinced that change is necessary, and be equipped with the tools to act.

3. Infrastructure. Transitioning to an integrated campus environment requires robust, financially sustainable and future-proofed infrastructure. University infrastructure will need to be adaptive and scalable, and support learners and faculty staff to teach and learn in new ways and agnostic of location. Doing this will require effective investment decisions in areas as diverse as storage, compute, virtualised services and application management.