

Turning a digital vision into reality

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The potential of technology to reinvent higher education has recently resurged in popular consciousness with the articulation of the idea of the Massive Open Online Course (MOOC). At Victoria we are avoiding radical technocratic transformation by engaging a process of collective sense-making and progressive capability building to better understand and take advantage of the affordances of technology. We outline our six-year strategy of organizational collaboration and change intended to help a research-focused university evolve and grow its capability, agility and aspirations for technology in learning and teaching, and discuss the progress to date.

Keywords: organisational change, transformation, sense-making

Introduction

The importance of technology as a tool for stimulating change in higher education has been starkly apparent over the past couple of years. By articulating a strategy for mass online educational experiences Stanford, Harvard, MIT and a variety of other institutions and their corporate partners have shaped the narrative of higher education internationally. The educational significance of many MOOCs is clearly in question, particularly as a means for addressing the limitations of existing approaches, but the way that institutions like Harvard have used technology to influence their own educational plans and those of others is clearly apparent (edX, 2012).

The evolution of Harvard's use of ideas inherent in MOOCs to advance their strategic position is a powerful model for other institutions to consider. Harvard is using technology to reinforce their elite status by using it to sustain the community of alumni. As a result, rather than risking even the perception that they are compromising the quality of their formal qualifications, they are instead strengthening the social networks that are a significant part of the benefit obtained by studying at an elite university (Coughlan, 2013).

In addition to their own strategic and operational activities, Harvard and other institutions describing MOOC strategies are influencing other organisations, even entire sectors of higher education, and stimulating an engagement with technology and educational delivery that is being shaped by the statements made by Harvard and others. This manipulation of other organisations is described as a shaping strategy (Hagel *et al.*, 2008) and typically reinforces the dominance of the shaper and leaves other institutions back-footed and reactive. Institutions able to maintain a clear and well-defined sense of their institutional purpose and identity are less susceptible to this manipulation and can remain focused on identifying ways that new technologies enhance their success.

This way of considering technology strategically as a tool to enhance an institution's wider strategic objectives underlies this paper. All too often technology is positioned as a means of radical transformation and re-invention that devalues the existing strengths of the institution and its staff, and results in technocratic visions that are hard for many people to engage with and use to enhance the outcomes experienced by our students. The key strength of universities, the aspect that distinguishes them from all other educational institutions, is the depth of expertise of the academic staff and their role as leaders; critics and consciences of our societies, using our expertise to improve the world.

Rather than transformation, technology can be used to help the university collectively make sense of its place in a rapidly changing world, responding to the wide range of forces acting on higher education as it grows in scale and responds to the inevitable shifts in the economic and political landscape. This process of sense-making (Weick, 1995; Weick, 2009) provides a means by which all staff can engage with the implications of new technologies and the ways that they can be used to sustain and strengthen academic work.

Weick (1995, p.17) characterises sense-making as having the following seven properties:

- Sense-making is social in nature;
- Sense-making is grounded in identity construction;
- Sense-making is retrospective;
- Sense-making is enactive of sensible environments;
- Sense-making is ongoing;
- Sense-making is focused on and by extracted cues;
- Sense-making is driven by plausibility rather than accuracy.

By adopting a sense-making approach to realizing the strategic impact of technology, as opposed to a technocratic transformation, institutions can use technology to engage in purposeful change owned collectively by the university community. Institutional leaders assist this through sense-giving; a process of leadership and communication of messages that trigger and sustain sense-making. Much as Harvard is using MOOCs to strengthen their elite position, other institutions can use the engagement with technology to develop their understanding of their key strategic goals and organizational values. This approach is being used at Victoria University of Wellington to sustain a six-year strategic change process aimed at strengthening the institution and positioning the organization to reap the benefits of a constantly changing environment and an ongoing flood of new technologies.

The Victoria Journey

Background

Victoria University of Wellington is one of eight New Zealand universities. Located in the New Zealand capital it is a mid-sized university by New Zealand standards with 23,461 students in 2013 (16,885 FTE). The university operates in four different locations in Wellington and has a small number of distance programmes operating nationally and internationally, but it is primarily a traditional face to face university with the majority of students attending classes at two Wellington city locations. In common with other New Zealand universities Victoria operates as part of a wider sector that is tightly constrained by Government policies and the associated funding systems that currently do not facilitate the substantive use of technology for learning and teaching (Marshall, 2014).

In 2010 the senior management team instigated a working party to investigate the impact that technology was having and could have on Victoria's operations. The resulting working party report recommended that the university articulate a strategy for improving its capability to use technology for learning and teaching over a six-year period.

Many such strategies have been written by universities, often focusing on the development of high performance networks or the provision of computing laboratories for students. The literature is filled with papers debating the merits of strategies on student ownership or leasing of computers and the importance or otherwise of providing computers. We chose at Victoria to adopt a process of sense-making, starting with a group of staff representative of different groups across the university who were asked to engage in a process of strategic visioning through the use of scenarios.

Scenarios as a tool for sense-making and sense-giving

Scenario planning (Richards *et al.*, 2004; JISC, 2008; Higgins *et al.*, 2012) provides a means by which organisations can explore the characteristics of possible futures allowing for the possibility that significant changes might occur, rather than incremental change driven by operational considerations. The resulting scenario descriptions are not intended to accurately predict the future, rather they provide a means by which the implications of different futures can be analysed and strategic choices made that maximise organisational success irrespective of the future that transpires.

We used scenarios at Victoria to help us imagine how future events might challenge our perceptions of the University, the experience of our students, and the role that technology plays in learning and teaching. The scenarios were developed in collaboration with Professor Ian Yeoman an internationally recognised expert on futures research. The scenario scales were created through a process of expert engagement and consultation. Participants were approached nationally and internationally to identify key drivers of organisational and technological change. A group of fifteen experienced staff at Victoria drawn from across a range of academic

and support roles and representing a range of disciplines were also used to brainstorm the likely impact such drivers might have on New Zealand institutions, and on Victoria in particular.

The Victoria process identified two major drivers as having the most significant impact on responses to our questions. The horizontal axis focuses on the issue of money, running from financial prosperity to financial austerity. The vertical scale describes the impact that technology has on normal life, running from a sense of containment where technology is used but does not dominate daily life through to a pervasive integration of technology into individual lives and society in general. These contrast with the axes identified in the contemporaneous DEANZ Scenario exercise which were focused on the tension between inward looking academia and outward facing engagement with external stakeholders such as employers, and on the tension between standardisation and flexibility (Higgins *et al.*, 2012). The DEANZ axes allow for engagement across a wide range of educational provision models, while the Victoria set was deliberately chosen to focus on the context of a single university intending to retain a sense of coherent identity within higher education.

The four quadrants formed by our axes frame the four scenarios: the *Economic Powerhouse*; the *Ivory Cybertower*; the *Digital Agora*; and the *Modern Academy* (Figure 1). These names evolved from the discussion and brainstorming by the local staff and were chosen to encourage a positive engagement with the implications of operating in the environment defined by the quadrant.

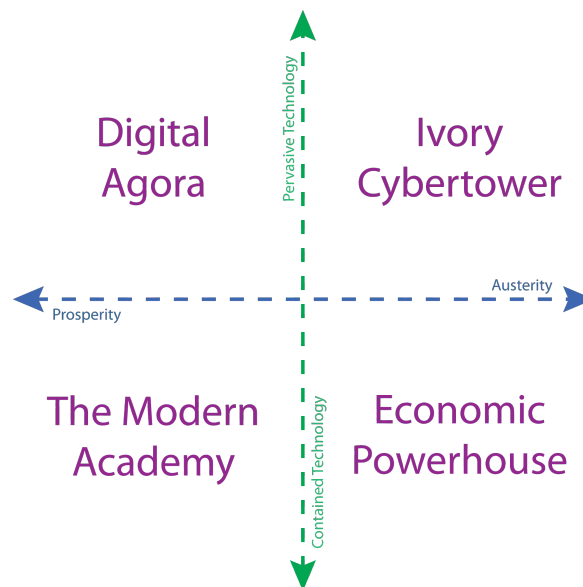


Figure 1: Scenario axes and descriptions

Scenarios are a tool for stimulating sense-making and help identify important trends or issues that can be responded to irrespective of the actual future the university might experience. None of these four scenarios completely and accurately describe the future, but hopefully they provoke the imaginations of staff engaging in strategy and planning and stimulate a creative and positive engagement with the future vision for technology's place in the future of learning and teaching in New Zealand. To assist this creative enablement scenarios are contextualised with a variety of specific technologies and outcomes of social change identified in the brainstorming. In the creation of our digital strategy, these were used to illustrate the impact of the different strategies identified and allowed participants to utilise sense-making methodologies to pinpoint a desired digital future state for the institution.

As an example, the *Economic Powerhouse* scenario was constructed to reflect the challenges faced by an environment of financial constraint and where technology use is focused and limited in scope rather than used to drive larger scale change in practice. The scenario 'capsule' is designed to provide a context for wider engagement while attempting to avoid any negativity (despite the challenges that limited resources impose). A short version of the capsule is quoted below (the full scenario capsules are provided online; Marshall, 2012):

In the context of austere world economies the university sees its role as providing a solidly reliable tertiary education for students in undergraduate and postgraduate study. The ability of students to quickly demonstrate value to employers and for the university to support economic

growth defines priorities for the structure of the degree experience and the role that technology plays in it. The university is seen by society as being an efficient provider of an educated and skilled workforce, reinforced by the government imposed mergers with the now non-existent urban polytechnic sector that saw the creation of urban single public tertiary providers in each city. Strategically, the university talks about the impact our teaching and research is having on the economy and the partnerships we have with specific employers and industries for research, internships, practicums, and as destinations for our graduates.

The teaching and learning focus of the university reflects a strongly vocational and career focus with applied research apparent throughout the student experience. Student numbers are balanced between undergraduate and postgraduate, with large increases in both groups and a student population of approximately 45,000 students. The vast majority of students are full time and expected to attend classes on campus. Undergraduate degrees are structured with the majority of courses defined by the choice of programme/major and with capstone and interdisciplinary courses used to provide integrative experiences. Internships, practicums and the use of industry facilities and staff during teaching are common. Changes in the structure of degrees mean that students can receive an honours degree in three years if they perform well in their first year of study. A Masters degree is achieved in four years through a further one-year thesis following the Honours degree.

This scenario sees technology as having a clearly defined and circumscribed role in the lives of students and the university. Financial constraints mean that investment in technology is carefully managed to minimise costs. Performance information is collected routinely on a wide variety of student and staff activities and used to monitor the efficiency of systems and manage costs tightly. The university provides a basic technology platform modelled on the standard workplace students will likely experience, with a heavy use of purchased content and tools. Economies of scale with large cohorts of students mean that lectures are recorded and delivered via video as well as in large lecture theatres. Content is licensed from commercial publishers and students are expected to purchase an electronic reader in order to access textbooks

From scenarios to a collective vision and strategy

These scenarios provide a mechanism for engaging with the wider university community, responding to the social nature of sense-making, and providing sense-making 'cues' that suggest future versions of the university that diverge from our current situation. A pan-university forum 'AkoVictoria' was held to explore these scenarios and consider the implications across the different disciplines and support functions of the institution. Approximately 120 staff and students representing the full diversity of the university attended and were given the opportunity to engage in a structured exploration of the scenarios. This culminated in a Delphi style brainstorming activity framed by the question:

What could the University be doing to better take advantage of technology for learning and teaching in an uncertain but rapidly changing future?

Participating staff used coloured notes to identify their faculty or support area as part of the consent process for the activity (human ethics approval for the anonymous data collection was obtained). The ideas created by the attendees were collected and analysed to identify key themes and priorities. Table 1 shows the top four summary items identified, all of which were strongly supported by all of the faculty and support groups participating. The information from the various consultation exercises was used to create a statement of the vision the university has for its learning and teaching activities and the role that technology could play in supporting and enhancing those goals. This was used to create the Vision and Strategy for Digital Learning and Teaching at Victoria 2012-2017 (<http://www.victoria.ac.nz/learning-teaching/academic-development/digital-vision>), which was accepted and funded by the Senior Management Team. The key goals of the strategy were:

Victoria students will experience a professional, supportive and enabling digital learning technology environment aimed at ensuring our students succeed in the modern world. This environment will enhance and extend student learning experiences through participation in a lively, innovative and scholarly community, both physically and online.

Technology will be used to facilitate the engagement of students through their experience of:

1. Programmes of study designed to maximise the positive impact of technology on students' critical engagement, motivation and creativity. Innovative digital technologies extending the impact of formally scheduled face to face contact by preparing, informing and framing the student's learning and enquiry, enabled and enhanced in partnership with staff and other students; and
2. An efficient, seamless and professional service, administration and learning environment designed to support individual student's engagement with their studies and ensure that students are able to focus their energy and attention on learning.

Table 1: Technology issues identified by staff in faculties and support groups

Issue	Humanities/Education	Science/Engineering/ Architecture & Design	Commerce/Law	Library/IT/Facilities	Student and Academic Services	Total
1 The teaching and learning purpose for using digital technology is unclear;	15	9	24	22	22	92
2 Staff need support and assistance in developing their digital technology skills and knowledge;	9	9	16	27	23	84
3 Staff need access to a comprehensive set of technology tools to support the range of activities in learning and teaching;	16	14	13	26	15	84
4 The systems infrastructure supporting learning and teaching needs to be reliable and perform well under the load of learning and teaching activities.	13	9	11	17	12	62

This strategy identified the importance that the physical campus plays in the intellectual life of the university, and chose to focus on the role that technology could play in enhancing the impact of time spent on campus, either informally or formally. At its core the vision focuses on how technology can enhance the experience of students attending a face to face university with courses framed around formally scheduled sessions, be that lectures, seminars, tutorials, laboratories or a myriad of other opportunities to meet in person with staff and other students. The objective is to maximise the outcomes from face to face time by using technology to help students prepare for sessions, engage effectively while together with other people, and then sustain and extend their engagement subsequently.

The vision and strategy recognise that this occurs in a range of contexts (Figure 2). At the heart of this figure is the formally scheduled meeting enhanced by technologies that operate both physically in the space and also digitally as a virtual overlay and support to the real world activities. For example lectures are supported with the use of audio-visual equipment to display information and to record sessions, but also with networking and power so students can use collaborative technologies to interact with each other and the academic as part of the formal class session. Outside of the lecture theatres, these technologies are also provided in ways that support informal collaboration by students and staff through provision of physical spaces near the lecture theatres equipped with suitable furniture, power and networking, and through the use of online technologies designed to support collaboration around lecture recordings, or to continue discussions started in the lecture. Other layers in the model reflect individual study and also the role that the university has in sustaining and building a wider scholarly community with people who are not formally enrolled as students or working as academics but who nevertheless have an important role in wider intellectual life of the institution and its place in society.

An Initial Action Plan

To enable the implementation of the digital strategy and future vision of a technology facilitated student experience, ten core action points were developed to be delivered over the six-year lifecycle of the strategy (Table 2). These action points were developed to ensure that digital policy, support, capability and technologies were positioned as relevant and vital to a 21st century tertiary institution. They are designed to ensure Victoria University reaches a baseline level of digital preparedness in a sector where the future learners and researchers in tertiary education have grown up on BYOD, open access to information and a secondary education environment already enabled by digital strategy (21st Century Learning Reference Group, 2014).

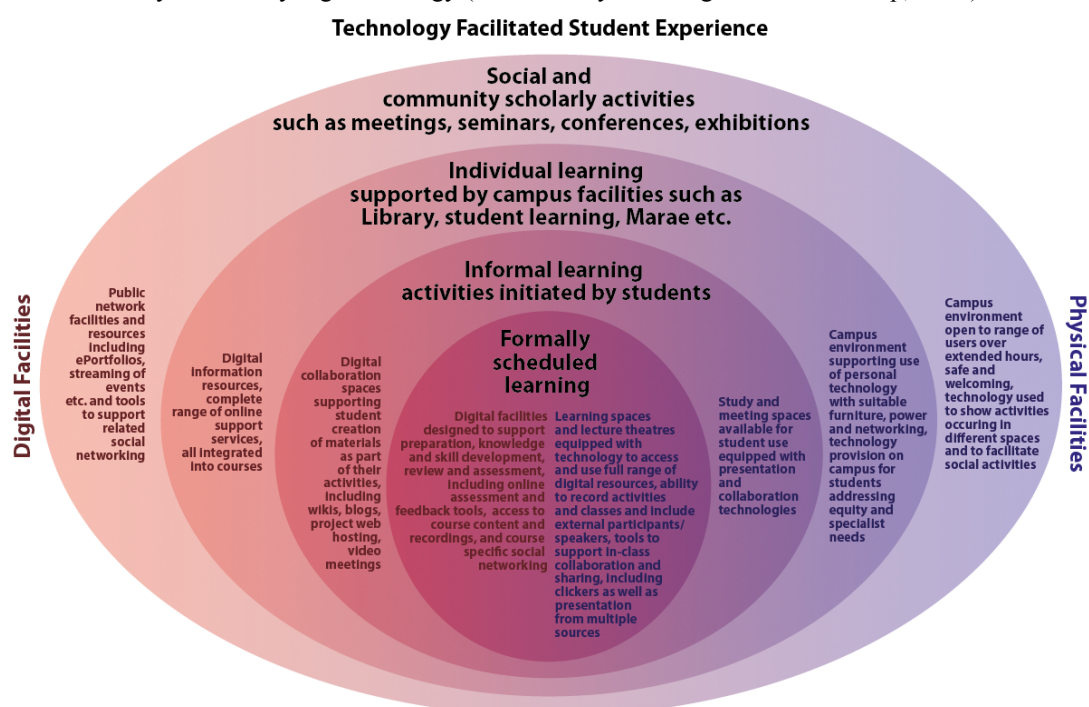


Figure 2: Learning and teaching contexts and supporting technology affordances

The delivery of the strategy is owned by a governance group who monitor and guide the implementation of the strategic action points. This group is chaired by the Centre for Academic Development and includes representation from other key support units such as ITS and The Library. The group is formally included in the university's IT governance structure. Through this group, action points were allocated to areas of support best suited and resourced to deliver on the action point. The true organisational focus of the strategy has been highlighted, as over seven academic or support groups have been instrumental in the current implementation of the strategy.

Table 2: Digital strategy action points

1	Articulation by faculties, schools and CSUs of plans for technology use in learning and teaching, reflecting their distinctive identities, pedagogies and students
2	Staff training and support in ICT use provided and on-going development encouraged for all staff engaged in learning and teaching
3	Faculty support staff employed to help staff engage with technology
4	Provision of student training and support for ICT use in courses
5	Encouragement of a change in the way face to face time is used in courses
6	Development of a technology platform and roadmap for investment in new and improved learning and teaching technologies
7	Development of a policy on minimum course presence online
8	Support of innovation through the innovation incubator
9	Course information management and publication
10	Technological support for assessment activities

For the first year of the strategies acceptance building awareness, developing a learning technology support model and investigating the current ‘digital academic state’ at Victoria were seen as priorities (action points 1,2,3). The activities undertaken included the employment of a small number of part-time staff based out in the faculties and drawn from the schools and faculties. Typically these Contacts for Academic Technologies (CATs) are graduate students or support staff involved already in some aspect of academic technology use. A detailed needs analysis was also conducted with staff across the university and used to contextualise an on-going programme of engagement conducted jointly by CAD and ITS staff who regularly attend school and faculty meetings to provide briefings and updates on the actions and receive feedback and ideas to improve the value of the work being done in the specific contexts of particular disciplines or support functions.

Changing models of support

The clear need for a comprehensive programme of staff development in the growing range of tools being deployed (action 2) has resulted in the creation of a new role in the ITS group focused on building staff capability. One of the first activities undertaken has been the creation of a skills capability matrix that maps the set of technologies against different staff roles and defines the level of knowledge needed. This is initially being used to help the ITS support staff build their own capability to support a wider range of tools, both as an important activity in itself, but also to test the model and assist in the development of support resources. A just-in-time approach enabled by one-on-one support is being used rather than a traditional workshop programme, in response to the needs analysis that clearly conveyed staff needs for a more responsive and granular model of development.

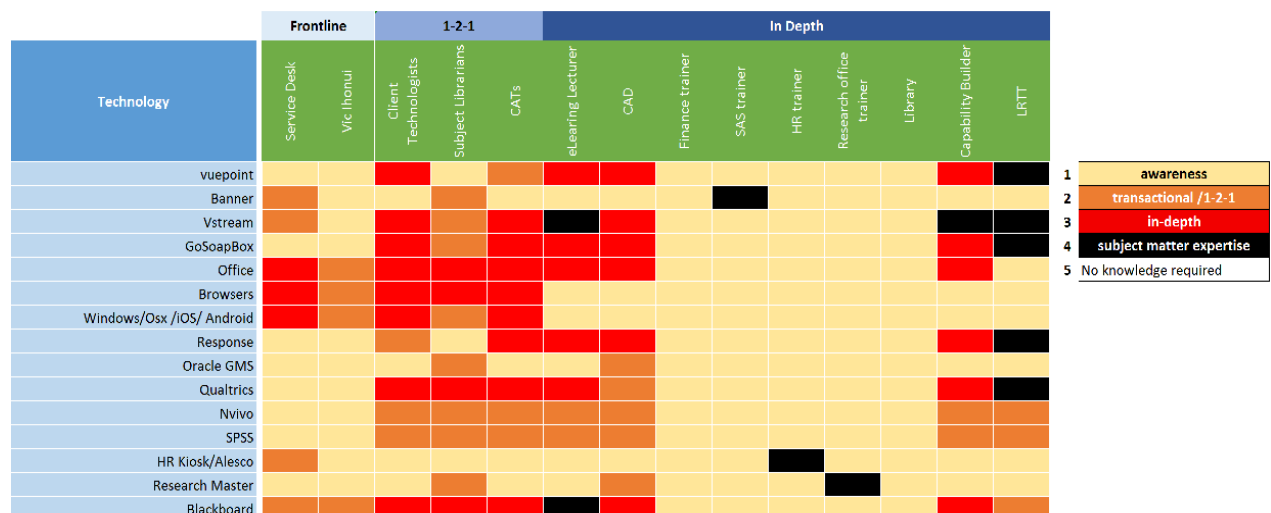


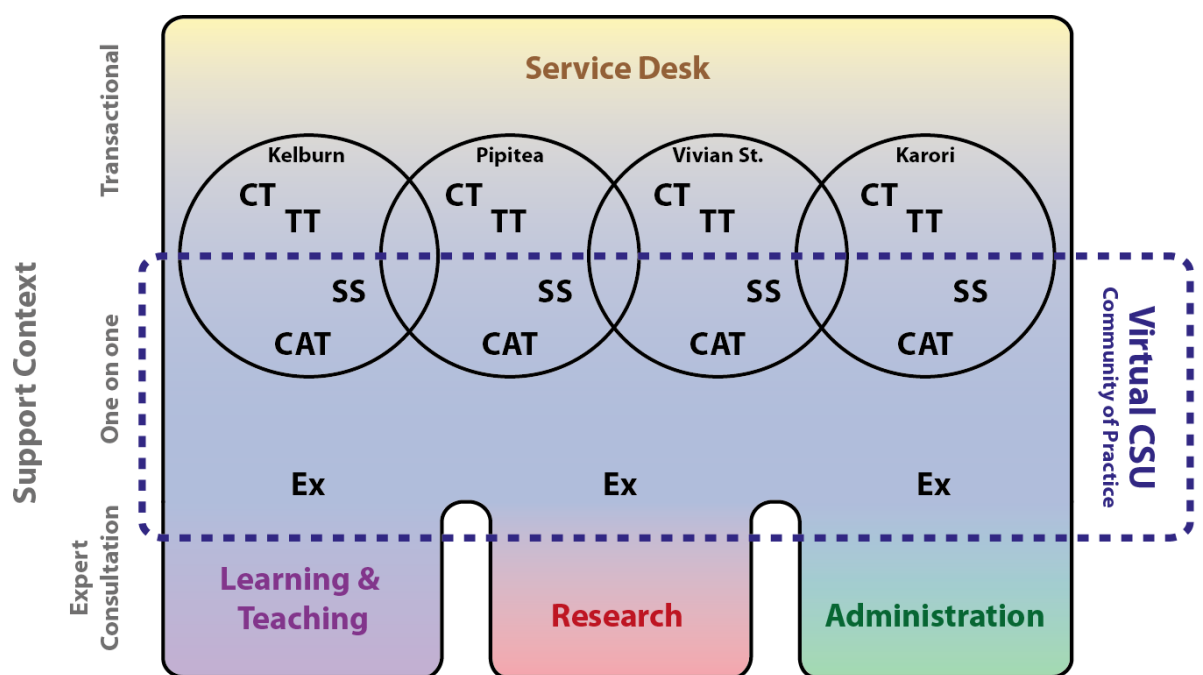
Figure 3: IT Skills Capability Matrix

One of the major outcomes of the engagement between CAD, ITS and other support groups has been the recognition of the value that greater collaboration at an operational level brings to the university. Feedback from the faculty and support service staff clearly conveyed the need for technology support to be delivered with greater awareness of the particular needs of individual staff, and the importance that long term relationships have in building capability and confidence. The CATs demonstrated on a small scale the value of having support staff located with the people they were supporting.

The support model developed out of this experience is summarised in Figure 4. This diagram illustrates a number of key points about the Virtual Central Support Unit (CSU) concept. Fundamental to it is the absence of vertical silos separating the areas of learning and teaching, research, and administration. This reflects the reality that while these are described as separate business outcomes, at the level of the individual staff member they blend into each other. Skills and knowledge obtained to support technology use for research are likely to assist in teaching and administration tasks, and support people assisting someone in developing technical knowledge and confidence are potentially able to help the user identify a range of ways a new technology might be valuable.

The support model also has a hierarchy with transactional support (password updates and quick fixes), one on one support and expert consultations recognising the range of support contexts in a large organisation. Teams of

one-on-one support staff with a range of primary roles are shown in circles reflecting their alignment with specific faculties and campus locations, but with the circles overlapping to emphasise their collective participation in a support community of practice (the Virtual CSU). Experts with specialist knowledge provide a third level of support, both to staff needing extensive in-depth assistance, but also to the other support staff with whom they have a mentoring responsibility as partners in the Virtual CSU community. An important point to emphasise is that the one-on-one and expert staff might be managed by a variety of organisational units. They work with colleagues from different groups routinely without the need for direct managerial involvement and with outcomes valued by all of the groups. The intention is that the depth of this model also enables internal career paths for support staff who may start with transactional roles, but evolve through experience and training to ultimately take up positions as experts themselves. In so doing we create a self-sustaining model of staff development that has already started seeing the university identify people with personal and technical strengths that we can grow ourselves, a much more effective strategy than hoping to attract people with specialist skills on an internationally competitive employment market. This model embodies many of the aspects of sense-making through its recognition of the need for an on-going and social model of exploration, and its creation of new identity for support at Victoria.



CT: Client Technologist TT: Teaching Technologist SS: School Support CAT: Contact for Academic Technology Ex: CSU Experts and Specialists
 Note: Multiple FTEs are needed in each of these roles

Figure 4: Virtual CSU Support Model

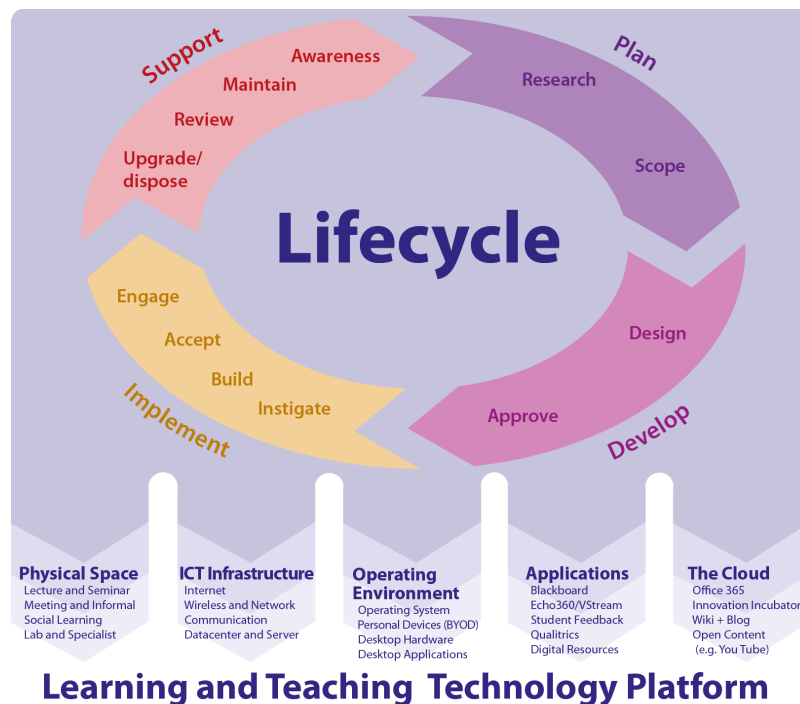


Figure 5: Technology Platform and Lifecycle Summary Overview

In addition to the support model, we have also articulated a technology platform framework (Figure 5), which explicitly recognises the range of learning and teaching contexts affected by technology (physical spaces through to the world of online services commonly referred to as the cloud). Rather than a static enumeration or service catalogue of supported technologies, this provides the basis for the creation of a formal lifecycle sustaining, developing and innovating the platform. The lifecycle shown in Figure 5 applies to each of the learning and teaching contexts listed along the bottom and has been elaborated into detailed standards supporting the engagement into each space.

This is an on-going work in progress, which started with the physical spaces. Working collaboratively with the Campus Services group and their external consultants, CAD and ITS, we have defined the standards for new spaces, redefined the processes of consultation and engagement to understand the future needs for spaces and the ways by which technology-enabled teaching and learning can be supported now and into the future. These new approaches have been trialled in the redevelopment of several existing rooms, and in the planning for two major new projects on campus and have seen a dramatic improvement in the level of engagement from a variety of stakeholders and the introduction of several innovative ideas. Similar positive outcomes are anticipated as we replicate this model throughout the other contexts.

One of the key aspects of the lifecycle is the desire to not just support innovation but to work actively to show that it is valued and enabled proactively. From a technical perspective this has meant the creation of an innovation incubator space online (<http://hub.vicinnovate.ac.nz/>) which serves both as a community hub and communication space and as a means of soliciting new innovation projects. An innovation incubator is a managed environment that is used to support innovation projects in a way that encourages exploration by staff, but within a management framework that:

- Reduces the threshold needed to engage with technology;
- Encourages and supports collaboration and a scholarly assessment of innovations;
- Controls costs;
- Reduces unnecessary duplication of effort;
- Ensures security of data and access;
- Provides a mechanism for formal review and decisions about ongoing operational use;
- Collects information on the experience of staff with particular innovations to inform future ideas.

The hub is itself an on-going innovation project deployed on the Amazon AWS Cloud infrastructure. This was a deliberate decision intended to give us a means of testing technologies and processes before we needed to

support staff wanting to use them for other innovation projects. The hub's deployment on the cloud has been a useful mechanism for exposing and working through policy and operational issues with key groups including our ITS group, especially the network security issues, and our marketing group.

From a non-technical perspective, innovation and confidence in technology use is also being supported through an academic and general staff-led community of practice for learning and teaching enhanced and enabled by technology. Key to the success of this has been the ownership of the group by its members, enabled quietly by support from CAD and ITS staff who participate but avoid being seen to lead the group. This group has created a regular schedule of staff presentations and workshops that are actively building confidence, capability and ownership of the changing pedagogical environment, engaging in their own process of sense-making.

Conclusion

Assessing the impact of the work outlined above is challenging. At a pragmatic level the best indication of success is perhaps the engagement and support from our Senior Leadership Team, who have funded this work despite the tight financial constraints facing the University. It is possible (and we have certainly done so) to collect measures of activity, input measures that record how many staff have been visited, how many web pages have been accessed etc. We can, and have, conducted surveys to identify issues and gain feedback on expectations and (dis?)satisfaction that show a positive trend. The problem is measuring the output that we really care about, staff confidence and knowledge leading to ownership of the role technology plays in their work, and the consequential impact on student learning and success. This identification of wider outcomes will be the focus of a benefits-mapping exercise that is planned in the near future. The goal of this process, derived from the Better Business Case model promoted by the New Zealand State Services Commission, is to identify a wide range of potential benefits that would arise from successful delivery of the strategy. This process has the advantage of reflecting the needs and goals of diverse stakeholders and providing a rich range of measures addressing financial and non-financial aspects. These can also support and sustain sense-making by generating on-going cues as to the impact technology is having on a wide range of activities.

Currently the best evidence we have is anecdotal and suggestive. Staff are proposing more projects dependent on new technology and more of them are actually trying new ideas with their students. The culture of disablement apparent prior to the initiation of this strategy is rapidly fading. The importance of technology as part of our work is no longer disputed, when we asked staff to identify issues the responses were all framed in terms of enabling their use of technology, not denying the need or placing it behind other priorities such as the PBRF. At a practical level, one measure of impact is the decision of the university to continue to invest in our work, including the significant restructuring of our IT group and the on-going appointments of additional support staff. We look forward to be able to show substantial and material contributions to the university's success in its wider strategic and operational goals, and to seeing staff at all levels of the university articulating with confidence and imagination ambitious plans for the role technology can play in their work.

Our real goal in this work is to see the university owning the process of sense-making for the impact of technology on learning and teaching. Externally we are faced by a government that is clearly promoting silver bullet solutions such as MOOCs and the growth of international student numbers despite substantial evidence that neither strategy will result in improved outcomes for our students, nor improve the quality and capability of the work done by universities. The political and financial context of New Zealand higher education (Marshall, 2014) gives the government enormous influence over institutions, but that should not be used as an excuse to avoid owning our own priorities and shaping our own visions for the role we play.

The support model discussion noted the overlap between the learning and teaching focus of the vision we are working towards, and the research and administrative activities of the university. Most, if not all of the work we are doing has a research dimension in itself, but all of the actions have a degree of impact on the universities capability in all three areas. An advantage of following a sense-making approach (as opposed to an explicit transformational one focused on reinventing learning and teaching) is that the exploration of the roles technology plays in existing work is open-ended and can draw on examples from all three spaces to improve any or all of them. The avoidance of a single model of success opens the door for serendipitous discoveries and synergistic growth in capability.

Models which act to amplify our ability to engage successfully in every aspect of university life are essential if we are to respond to the long term trends of declining public funding, demographic and economic change. Our current models of delivering degrees are not sustainable when delivered to a greater proportion of the population

and throughout adult lives, we need to be able to redefine and reorient our work so that we have greater impact with fewer resources and we believe that Victoria has started well in achieving its vision.

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Please cite as: Marshall, S., & Flutey, J. (2014). Turning a digital vision into reality. In B. Hegarty, J. McDonald, & S.-K. Loke (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings ascilite Dunedin 2014* (pp. 190-200). <https://doi.org/10.14742/apubs.2014.1076>

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