

Herding cats and measuring elephants: implementing and evaluating an institutional blended and mobile learning strategy

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The University of Western Sydney is more than half way through a three year strategic program to build its blended and mobile learning capacity. This paper presents a framework that has emerged from implementing and evaluating the blended learning strategy thus far; linking institution-led, academic-led, student-led and community-led components. It illustrates how all of these components form part of an integrated system, in which change needs to be managed as a whole. The experience to date has shown the need to notice and deal with the concerns of academic teaching staff, and to be clear about which measurements of progress are meaningful and relevant. The specific context of this university has determined how the various blended learning initiatives have been prioritized. Although other university contexts will differ, the overall framework could be applied in any institution to help align institutional initiatives to adopt blended and mobile learning, and to develop appropriate evaluation.

Keywords: institutional blended learning strategy, blended learning evaluation, mobile learning strategy

The strategic context

In 2012, the University of Western Sydney (UWS) embarked on an institution-wide three year strategy to transform its learning and teaching practices through investment in blended and mobile learning technologies. The Board of Trustees decided that the University will adopt “an ambitious but managed growth strategy” that includes:

- providing greater academic flexibility in course design and delivery and enhancing student choice
- diversifying entry pathways increasing participation [of groups under-represented in HE]
- undertaking essential capital refurbishment, IT infrastructure and building development, and investing strategically to achieve continuous improvement in IT services
- enhance our e-learning and e-research capability and capacity.

University of Western Sydney context

The University of Western Sydney has eight campuses serving the rapidly expanding and diverse population of the Greater Western Sydney region. Around 3000 staff support 42,000 students. Table 1 lists student demographics.

Table 1: UWS student profile

Measure	Profile
Location	76% of domestic students come from Greater Western Sydney
First in family	64% of commencing domestic students are first in family (neither parents has a degree)
low SES students	Highest number of students from low socioeconomic (low SES) backgrounds in an Australian University (over 9,000 or 24%)
VET sector pathways	15% come through the Vocational Education and Training (VET) system
Age	32% are mature age (25 years +)
NESB	32% are from non-English speaking backgrounds (NESB) and speak a language other than English at home, with students spanning 170 countries of birth
Work	72% juggle work and study
Outcomes	Success rates for low SES, VET entry and NESB students are equal or close to rates for the general student population

(Source: University of Western Sydney 2013 preliminary data as at September 2013)

Rather than opt for a 'bring your own device' (BYOD) strategy, which might be suitable for a more affluent student demographic, UWS decided that it would provide tablet devices to all new undergraduate students and to teaching staff from 2013. The aim was to have a direct impact on the student-led affordances of mobile technologies for learning (as defined by Gosper, Malfroy, & McKenzie, 2013), while investing in curriculum change over the next 3 years.



Figure 1: iPads ready for distribution

At the start of 2013, the main focus was on the logistics of providing institutional support for issue and use of over 12,000 iPads (e.g. Figure 1). Wireless coverage on all campuses was ramped up. Instructions and guides were put online and helpdesk support was organized.

Throughout the year, there was a program to involve teaching staff in learning how to make use of the affordances of iPads in their teaching. This included events ranging from basic introduction to iPads through to forums for those interested in sharing mobile learning pedagogical strategies. Champions (called iPALS) among the teaching academics were identified and supported; to encourage discipline-based innovations.

Meanwhile, starting in the 2nd half of 2012, blended learning specialists were being recruited to help with work on priority curriculum development projects within disciplines. By the end of 2013 there were around 50 BLADEs (Blended Learning Advisors & Designers), organized in a hub and spoke model with a small central team coordinating a discipline-based support network.

The first priority was to redesign 1st year undergraduate study units for 2014. In 2012 senior university leaders held meetings in all discipline groups to clarify the strategic intention of blended learning, defined as:

... a strategic and systematic approach to combining times and modes of learning, integrating the best aspects of face-to-face and online interactions for each discipline, using appropriate ICTs [information and communications technology].

Each academic program was asked to plan how they would progress this 'blending'. Monitoring was put in place, with data gathered centrally for reporting to the University Executive. The University invested in the face-to-face component of the blend, by building new formal and informal learning spaces on several campuses.

UWS has routine surveys for gathering student feedback on their learning experience. However, these provide relatively little data on how technology contributes to student learning. So there was a need to develop an evaluation strategy that would provide evidence of the effectiveness of the university's investment in blended and mobile learning, and in new campus learning spaces.

Relevant experience elsewhere

A study of institutions at different stages of maturity in blended learning adoption (Graham, Woodfield, & Harrison, 2013, p.11) noted that:

... even when a good number of faculty are able to adopt and implement blended solutions on their own, barriers related to institutional policies, structures, and lack of support can prevent large-scale faculty adoption.

The framework developed from the Graham et al. (2013) study is based on an organic and bottom-up adoption model, where institutional systems eventually adapt once there is change in majority academic practice. Another study examined two cases where a more active institutional change strategy had been used, and concluded that transformational institutional change related to blended learning requires “committed collaborative leadership that engages all levels of the institution” (Garrison & Vaughan, 2013, p.28). UWS is adopting something like this second approach, in that there was an explicit top-down lead backed up by resources, processes and evaluation, with a specified timeframe. Owston (2013) notes that implementing a blended learning strategy requires alignment of goals at all levels of the academy. One challenge in moving from the institutional rhetoric to the reality of blended learning provision across the institution is that there can be confusion about what exactly is meant by ‘blended learning’. Such confusion can only be resolved through people interacting to gain a common understanding, which can take time – perhaps longer than three years (Taylor & Newton, 2013).

The evaluation strategy

A paper presented to Ascilite in 2013 outlines the initial University of Western Sydney evaluation strategy as work in progress (Russell & Qi, 2013). The initial strategy built on experience from a survey carried out across three Sydney universities in 2010, on how students' experiences and expectations of technology, in their personal and their study activities. The study (Gosper et al., 2013) identified three aspects of technology provision.

- Institution-led (e.g. hardware and software provided by the university).
- Academic-led (how teachers use technology to enhance learning within disciplines).
- Student-led (how students choose to use technologies available for learning).

An analysis of qualitative comments from the students in 2010 showed that it was the academic-led aspect that was most challenging for institutions to manage. Wireless, networks, hardware and software provision can be managed centrally by strategic decisions. Students will use the technologies that they have available for accessing learning resources and activities. But changing the nature of the curriculum and learning activities that are formally assessed is more challenging (Russell, Malfroy, Gosper, & McKenzie, 2014; Torrisi-Steele & Drew, 2013). The clear organizational plans, leadership that is collaborative and distributed, and sustained commitment advocated by Garrison and Vaughan (2013) require inbuilt feedback loops and continuing adjustment based on reliable evaluation evidence.

Transforming teaching practice is not a straightforward linear process. University learning and teaching systems have been built up over time, and form a complex network of interconnected processes which are hard to change piecemeal (Russell, 2009). For example, the formulae and processes used for allocating academic teaching work have often been based on hours of classroom teaching. When some of the teaching work is online there is a need for preparatory work well in advance, on design and development of digital resources and online activities. Traditional workload planning assumptions can mean that staff time is not allowed for this.

The evaluation strategy therefore aims to assess how the University systems overall are adapting to the shift blended and mobile learning – students, teachers, policy, planning and governance as well as infrastructure. The evaluation uses a mix of quantitative and qualitative methods, broadly following the triangulation design described in *Designing and conducting mixed methods research* (Creswell & Plano-Clark, 2011, p.63). In this design, qualitative and quantitative data are gathered together, initially analysed separately and then interpreted in combination, to provide explanations of how the institution-led and academic-led technology provision is

influencing student experiences and outcomes. Four initial questions were used for the 2013 phase.

1. How has the 1st year student experience of technologies in learning at UWS changed since 2010?
2. How is the availability of iPad devices now influencing 1st year students' learning experience at the University of Western Sydney?
3. To what extent is blended learning already contributing to student learning experiences and outcomes?
4. How well are academic staff able to use online and mobile technologies in teaching?

Figure 2 provides an overview flowchart of the 2013 and 2014 evaluation plans and the main components are outlined below.

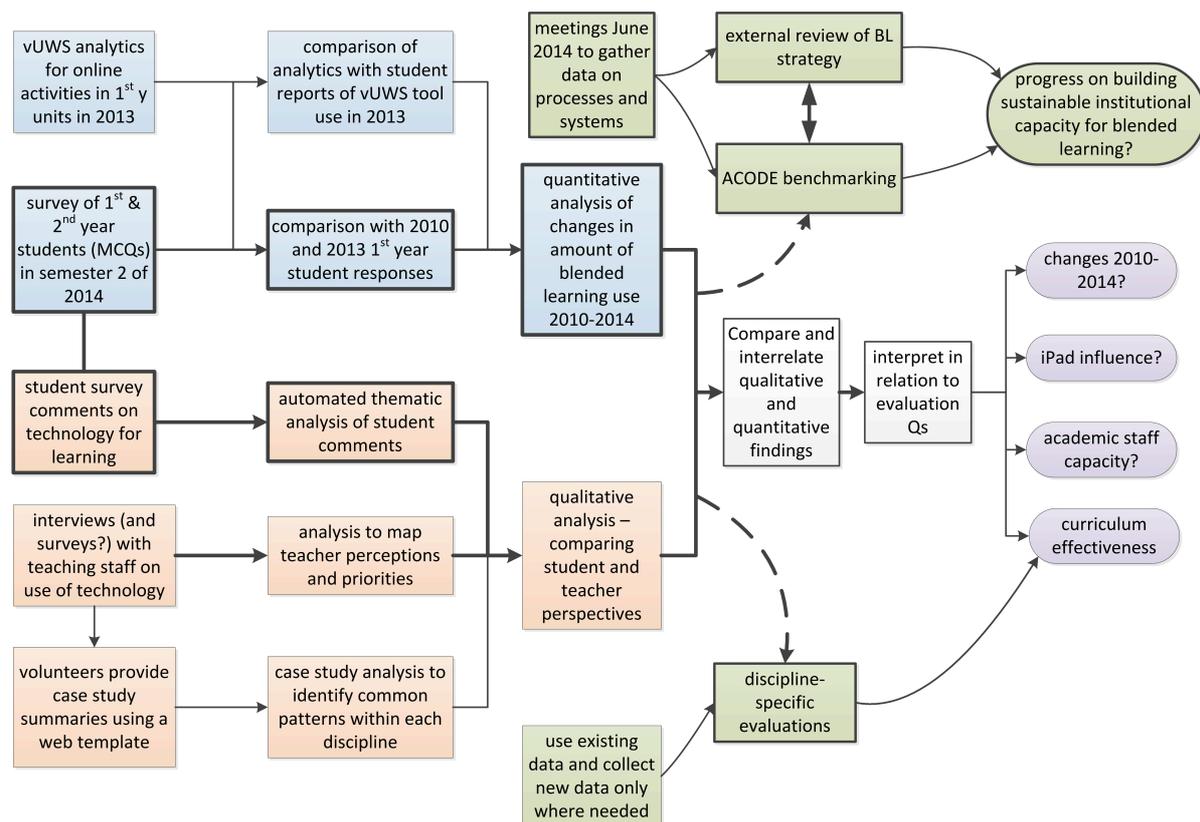


Figure 2: UWS blended learning evaluation plans for 2014

The student experience

A survey of all 1st year undergraduate students in September of 2013 used a subset of the 2010 survey questions, and compared these with corresponding 2010 responses. There were also new questions on iPad use, and on which devices students used for each activity type. The survey included two open-ended questions, identical to those used in 2010, which were run through an automated thematic analysis developed for the 2010 data analysis (Russell et al., 2014). The student survey will be repeated in 2014 with both 1st year and 2nd year undergraduate students, to provide a longitudinal picture as curriculum development progresses.

Focus groups with over 40 first year students provided more contextual depth. We have qualitative data not only from the survey comments, but also from student focus groups and interviews with 40 students, run by an independent research assistant who recorded and transcribed the student comments.

The staff experience

There were also individual interviews with staff who were teaching 1st year students in 2013, and/or preparing to teach 2nd year students in 2014. The interviewees were a cross-section from 10 teaching staff across 5 campuses representing 5 Schools. The sample included academic and professional staff employed sessionally, on fixed-term contracts and continuing appointments. The interviews aimed to tease out whether the support services and

resources for blended learning curriculum design are reaching their targets.

The interviews were semi-structured with questions focusing on institution-led, academic-led and student-led aspects of technology provision. Rather than recordings and transcripts, the interviewer typed notes as they responded and then provided an edited copy of these for each interview to check for accuracy afterwards, giving them the opportunity to add any further comments. The notes were then analysed for themes, manually using NVIVO software. One idea is that the thematic analysis of the interview data will be used to design a broader data collection from teaching staff in 2014, perhaps by survey.

Institutional systems

In May and June of 2014, the University of Western Sydney took part in a pilot of new ACODE benchmarks (still under development and not yet published). The ACODE benchmarking process is a self-assessment involving conversations across the institution. At the University of Western Sydney, representatives from two academic disciplines (including blended learning support staff), the Library, IT Services and the central blended learning support team were involved. The University of Western Sydney selected three benchmarks. The rationale for this choice was shaped by the three key objectives in the University of Western Sydney learning and teaching plan for 2012-2014.

1. Students - optimize student access, engagement, retention and success.
2. Curriculum and Standards – implement a curriculum characterised by innovation, engagement and excellence.
3. Quality - build staff capacity to engage in quality teaching.

By 2014, the University of Western Sydney had set up extensive data collection on the student experience and outcomes. But the support systems for curriculum and staff development around technology-enhanced learning were fairly new. Similarly, some of the strategic decision-making and governance processes around blended learning were still being put in place. Three benchmarks were chosen.

- Benchmark 1: Institution-wide policy and governance for technology enhanced learning.
- Benchmark 4: The application of technology enhanced learning services.
- Benchmark 6: Staff support for the use of technology enhanced learning.

The University of Western Sydney has also commissioned an external expert review of progress on implementation of the blended and mobile learning strategy. The review report is not yet available.

Case studies and discipline specific evaluations

While the University of Western Sydney is gathering and sharing information about case studies and experiences with blended and mobile learning designs, this aspect of the evaluation is still ‘work in progress’ at the institutional level. At the time of writing, the learning management system provides analytics at the level of study units, which teaching academics can use to evaluate their use of the online tools in relation to learning in the discipline. However, the intention is that teaching staff will be able to draw on a wide range of other data relevant for their teaching, via an institutional dashboard system. This should make it easier to generate evidence for pedagogical evaluations of blended learning innovations.

University of Western Sydney evaluation results to date

The results reported here are from data gathered in the second half of 2013 and the first half of 2014. The evaluation results, including analysis of institutional processes, forms the basis for an institutional framework for continued work.

Student survey responses

There were 740 responses representing 6% of the 1st year student population. Most of the students who have iPads are using them in all of their study units, and for most online activities. However there were exceptions, in that more students preferred to use a laptop or desktop for assignment submissions and library searches.

Despite the low response rate, an analysis of the demographic profile of the respondents showed that the sample was fairly representative of the population. A statistical analysis of discipline groups showed some significant

(95% confidence) differences between groups for some of the question responses, which in some cases were explained by contextual knowledge. For example, two groups reported significantly greater use of iPads by teachers than the other groups. In one, there had been a new curriculum introduced in 2013, with online resources replacing large lectures, and only small group tutorial and practical classes. In the other group, all the teachers had already been issued with iPads a year earlier.

In comparison with the corresponding responses from the equivalent 2010 survey (i.e., 1st year University of Western Sydney students), there were some shifts.

- There has been a significant increase in the frequency of some online learning activities since 2010, in particular the more common ones, such as social networking, online sharing of digital media, viewing teacher-generated pod/vodcasts.
- While email is still used for communication with staff, the most common communication between students for study purposes is social media (which may explain the poor response to an email survey invitation).

Figure 3 shows the responses to the question on frequency with which students used different tools in the online learning management system.

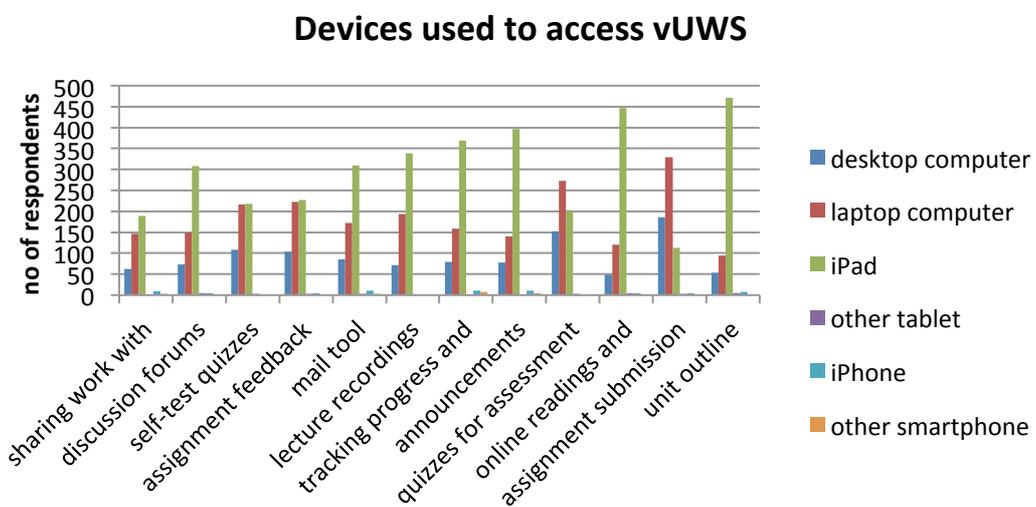
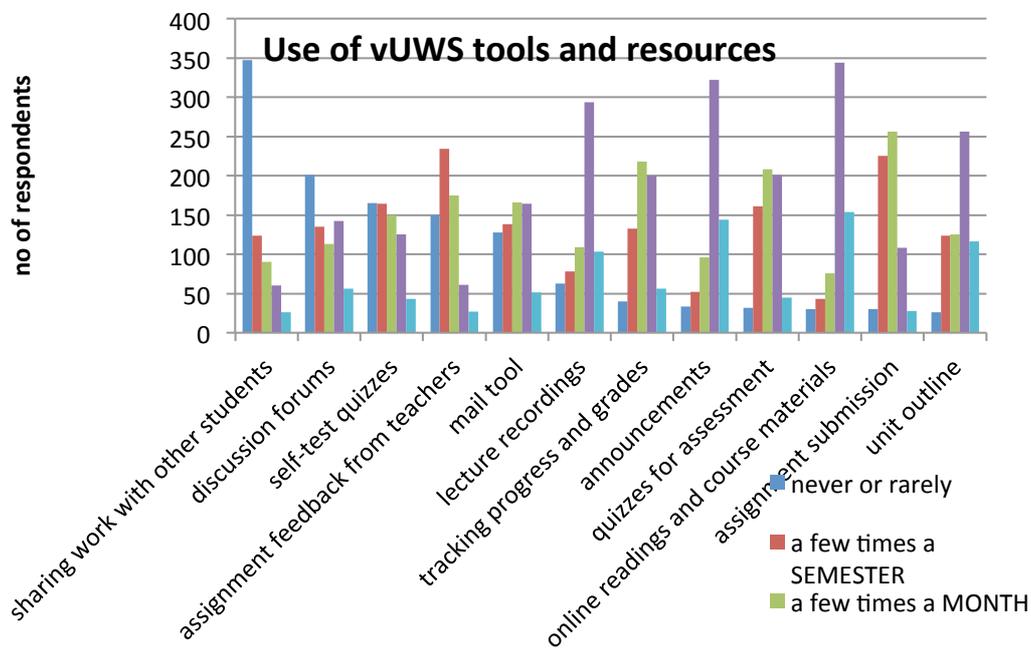


Figure 3: Responses to survey question about LMS (vUWS) tool use

Student focus groups, interviews and comments

Many of the stories told by students show how iPads are having a significant impact on the student learning experience – with or without curriculum change. Some examples:

Use the iPad mainly for everything I used to use paper for. Notes sync automatically to my phone and laptop so I have everything I need wherever I am.

It's more mobile and if I'm taking the train I can just open the iPad and read my notes. It's very efficient as you can transfer files from the laptop to the iPad and also edit work.

It's like you get your stuff in an instant and we don't have to wait for computer access, like going to the library just for something, where we can just use the iPads to actually access what we need.

Students also made it clear they had expectations that their teachers would use technology effectively:

It would be great if the teachers took it on a bit more. However in saying that, they do put lecture slides and recording on blackboard so that is helpful.

We've had maybe three or four different lecturers, and people do things differently, and some are more technologically inclined than others. I think it's been a bit of a learning curve for some of those lecturers as well.

Staff interviews

Thematic analysis results from the staff interview notes are summarised below under the institution-led, academic-led and student-led aspects.

Institutional support systems

The most common theme arising under institutional services was vUWS, and in particular some of its limitations – for example in tools for managing and monitoring student activities. Some of these corroborate student comments, for example confirming that students often prefer to use Facebook rather than vUWS for study discussions amongst themselves. Staff development support was also a common theme. Some quotes:

Students don't discuss anything in vUWS. So we don't know what their study discussions are about. ... for them Facebook is better.

I would like paid training in teaching and in technology. Our contracts specify hours in terms of classroom teaching time. ... I didn't do any training this year this year but was offered ... clashed with my teaching hours. I would even do if it wasn't paid ...

Academic-led use of technology

Academic-led themes raised in the interviews have included curriculum development plans and use of third-party or other digital resources, for example:

Nothing we've done yet is complete ... There is lots of follow up work to do on other units.

We collaborated with library to develop referencing support materials, and related this to skills students need for assessments. One particular resource from Massey University was superior to our resources.

Student-led uses of technology

The interviewees were also asked about their perceptions of how students are using their iPads. The staff interviewees have been noticing how students use mobile and online technologies effectively for learning in class, for example for taking notes and photographs in class:

First year students have iPads and most bring them to tutorials. They type on them and take pictures of presentation slides (which are often just text). Typically about two thirds of the students take pictures with iPads or mobile phones.

Institutional systems

The ACODE benchmarking process provided an opportunity to collate information about changes achieved, and underway, in the institutional systems for supporting learning and teaching. The technological provision can be measured in terms of network capacity, software installed and other tangible metrics. But curriculum change for new students takes several years to influence measurable graduate outcomes. The pedagogical evidence for technology-enhanced learning is therefore initially qualitative and narrative, rather than quantitative.

ACODE Benchmarking

UWS has identified technology-enhanced learning as a strategic priority, and has invested substantially in expanding institutional support systems. So the scores on many of the performance indicators for benchmark 1 (institution-wide policy and governance for technology enhanced learning) were fairly good compared with many of the other benchmarking participants. There were however a few recommendations arising from the exercise. For example we could more clearly articulate how the institutional leaders are taking into account input from different stakeholders. Some of the responsibilities for institutional services could also be clarified. Sustainability of the strategy, beyond the current 3 year initiatives, is still being considered, as governance arrangements for decisions on adopting new technologies at institutional level. Nevertheless, there is also a recognition that procedures for adopting new technologies have to be flexible and responsive.

Benchmark 4 (the application of technology enhanced learning services) focuses on support for effective use of technology in the curriculum. This is an area where UWS has made considerable investment, and has a clear strategic rationale for use of technology enhanced learning. However, as indicated by staff comments above, much of the curriculum development work is still in progress. It is too early to provide clear evidence of effective outcomes at the institutional level, in terms of the student learning outcomes. The self-assessment team estimated that the scores on performance indicators for this benchmark will improve considerably once more curriculum development has reached students, and when the planned pedagogical evaluation support systems (e.g. full learning analytics) are available. There are also plans to automate the thematic analysis of text in student blended learning survey comments, using text analysis software currently used for other routine surveys.

Benchmark 6 deals with support services for staff involved in technology enhanced learning. At the institutional level there has been effective sharing of case studies and good practice, supported by events, websites and guidelines. At the same time there has been funding for hands-on support for curriculum development within disciplines, including the blended learning specialists and time release for academic teaching staff. The BLADE teams were put in place during 2013 and the benchmarking teams noted that it had often taken time and effort to establish an effective presence among the discipline academic communities. One area for improvement identified was in the coordination between central and discipline teams, which relies heavily on informal networking. The benchmarking exercise also noted a need for better evaluation of staff support services.

Measuring and managing the 'blend'

During 2013, some examples of the kind of barriers referred to by Graham et al. (2013) came to the surface. One was in how blended learning designs were quantified. There was an institutional requirement that each School report on progress on plans for introducing blended learning. However this was at a fairly general level of reporting on numbers of study units redesigned to more blended formats. The BLADE network discussions noted some resistance from some teaching staff who were thinking of blended learning as simply replacing lectures with online lectures. Others were claiming to be 50% blended if half their lecture resources were available online. In some cases teaching workload was being calculated by formulae based on classroom hours, leading to concerns that online teaching work would not be recognised. This is not an irrational fear. A study in four Australian universities (Tynan, Ryan, Hinton, & Mills, 2012) found that academic work on online or blended learning 'requires more thorough auditing within specific contexts'. Academic workloads can be a contentious subject, and it is one where UWS is still working on better solutions for 21st century teaching. A BLADE subgroup therefore developed a proposal, eventually approved by Senate, to use a student-centred model of the 'blend' for curriculum design purposes. This means defining how the students (not the teachers) spend their time.

1. Time spent with a teacher physically present in synchronous learning environments.
2. Time spent doing structured activities online.
3. Time spent on self-directed study.
4. Time spent on work placements or external projects.

This definition makes it much easier to have conversations about curriculum redesign, and to report quantitative

progress meaningfully in relation to the graduate learning outcomes. For example, one might expect that the proportion of categories 3 and 4 to increase in later years of a degree program as students develop their independent learning skills and take on more contextualized activities. The model is built into a spreadsheet tool, also developed by a BLADE team, for designing study units of different durations, e.g. for summer intensive versions (see http://www.UWS.edu.au/qilt/qilt/blended_learning/resources/sunset_tool). UWS has also developed an institutional tool for curriculum mapping, which is being used in some disciplines to align curriculum redesign with graduate learning outcomes. The distributed but coherent response to the challenge of ‘measuring the blend’ shows some of the characteristics advocated by Garrison and Vaughan (2013) for transformative change at the institutional level.

Analysis and discussion

There are still gaps in some of the institutional systems for supporting blended learning. Some of evaluation feedback loops for pedagogical effectiveness are still to be closed. Like many other universities, UWS is still putting in place some of the learning analytics. Where UWS perhaps differs from some other universities is the clear top-down strategic direction and rationale for investing in blended learning, which is grounded in the UWS context and its mission to ‘bring knowledge to life’ in Greater Western Sydney.

An overview model

Figure 4 shows a model of the UWS blended learning strategy as it has developed to date. The diagram pulls together some of the experiences, conversations within UWS, and some of the previous studies cited above – using Maslow-type hierarchy. The top level is about the social and community contribution made by graduates as expressed in the leadership rhetoric, which drives the strategic investments in technology-enhanced learning. The bottom level provides access to the basic technical and organisational facilities that make technology-enhanced learning possible, which require institutional funding. The three middle sections show what needs to be done to convert the rhetoric into reality, and what evidence is, or will be, available to track progress.

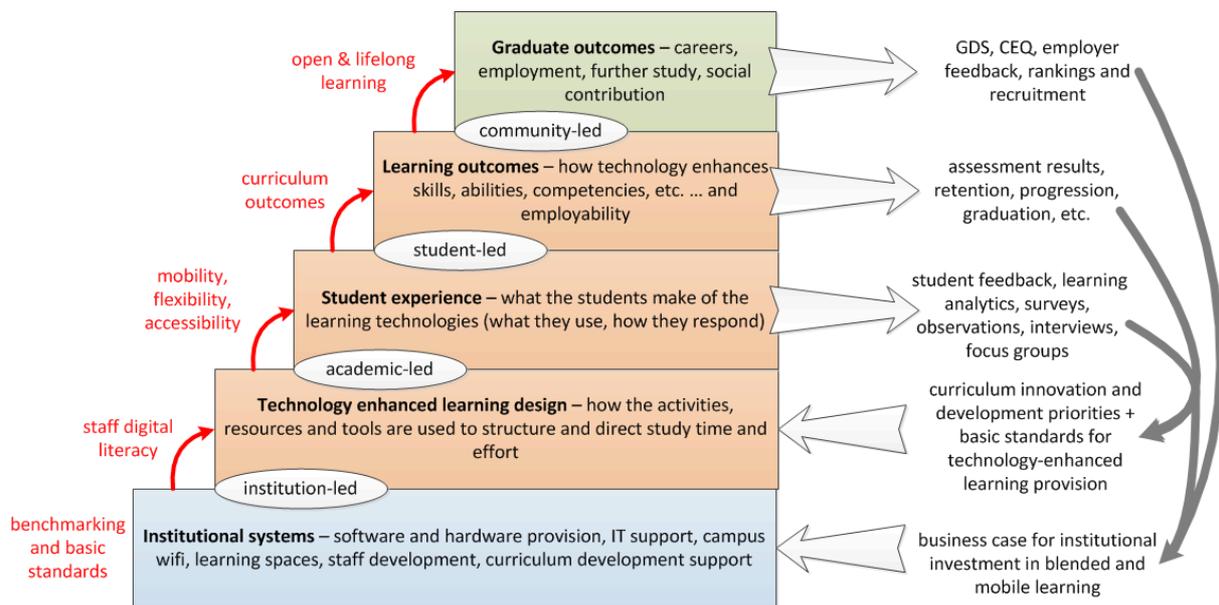


Figure 4: A model for planning and evaluating blended learning support in universities

Progress and challenges

In 2014 UWS is half way through a three-year change program, which is on track but incomplete. What we have found is that there were a number of university systems that having to adjust to enable the successful implementation of curriculum change for blended learning. It was not just a simple matter of putting the technology in place and expecting academic teams to adopt it. Some of the ‘elephants in the room’ in this process were the assumptions about how the learning activities are measured, and about planning academic staff time for new types of work.

Students' main complaints in 2010 and in 2013 were about inconsistency in how their teachers were using technology. For complete curriculum change it is no good relying on a few innovators and early adopters. This simply raises students' expectations without satisfying them. At UWS the iPad issue helped to focus initiatives around introducing blended learning designs for 1st year students. There have also been a few complete degree programs that are being redesigned. There is a tradition of individual responsibility for teaching in Australian universities. So building curriculum-wide team-based and supported blended learning design capacity can be a bit like herding cats: challenging, but not impossible with alignment of incentives and purpose.

Implications and recommendations

While the context and the strategic priorities of other universities will differ from those of UWS, there are some generic learning points from the UWS experience thus far.

- Alignment of the top and bottom levels in Figure 3, through a strategic rationale and appropriate institutional investment are essential.
- Curriculum redesign needs to be supported systemically within disciplines. This means blended learning specialists on the ground to work with staff hands-on, and allowing staff time to work together with them on curriculum design, ideally across whole programs of study.
- Evaluation has to include a mix of qualitative and quantitative evidence, not just on the students' experiences. In particular staff feedback can be important for identifying barriers to curriculum change.
- Learning analytics have the potential to link together various aspects of the evaluation and identify patterns that can inform institutional strategy and future investments. But there is much work to be done to realise this in most institutions.
- Learning analytics and institutional data can also be used to facilitate pedagogical evaluations within disciplines, as part of systemic and evidence-based curriculum redesign.

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