Building a culture of educational excellence
Strategic Planning for 2016–20, Discussion Paper no. 3
August 2015

Foreword

As we reach the mid-point in the design of our 2016–20 Strategic Plan, feedback on the educational experience is clear.

Staff and students have delivered strong advice: value teaching and research more equally; recognise and celebrate excellent teaching; improve our learning systems and technology; and increase learning experiences that challenge disciplinary perspectives and integrate students with community and industry in real-world problem-solving.

The first education discussion paper, Developing a distinctive undergraduate education, concentrated on the learning outcomes part of this equation, with a specific focus on the core qualities or attributes of the Sydney graduate, alongside proposals for change to the University’s curriculum framework.

This second paper, Building a culture of educational excellence, considers the creation of the educational environment that will make this possible; how we build an open, collaborative and innovative learning and teaching environment that encourages staff and student interaction and engagement with the outside world, one that is open to experimentation and responsive to research.

Importantly, we cannot create a world-class educational environment without a world-class research environment and so I would encourage you to read this second education discussion paper alongside the second research paper, Building a culture of research excellence.

This is a really exciting opportunity to think about how we create a university where both teaching and research thrive and where excellence in both drives the University of Sydney to the realisation of its full potential.

Dr Michael Spence
Vice-Chancellor and Principal
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1 Introduction

The first education discussion paper focussed on the characteristics and purpose of our undergraduate degree programs – what we seek to achieve educationally, and why. It outlined some proposals for the qualities of Sydney graduates, a curriculum framework supporting their development, and some specific options for undergraduate degree architectures in which that curriculum framework might be embedded.

The purpose of this second paper is to turn our attention to the ‘how’ of learning and teaching, and to our aspiration for educational excellence at the University of Sydney.

That we aspire to educational excellence is evident from staff and student responses to the University-wide survey conducted in April 2015. Equally clear from this recent survey, however, is the gap between current state and aspiration. A vital task for the 2016-20 plan must be to address this gap: proposals for doing so are the subject of this paper.

Running through these proposals are several key themes:

- collaboration
- innovation and experimentation
- commitment to evidence, feedback and analysis
- openness.

In line with our first theme, collaboration, we propose greater collaboration with each other in many aspects of the educational process – in curriculum design, in the creation and delivery of resources for broader skill development and cultural competence, and in interdisciplinary and inter-professional initiatives.

We propose adopting more collaborative learning designs for our students, while working together to deepen our engagement with community and industry, developing collaborations with experts in these sectors as we draw more authentic and challenging issues into the classroom. To the extent that we are successful in this endeavour, we will also be building collaborations with our students as we guide and support them to seek solutions to problems for which there may be no ready answers.

The second theme is innovation and experimentation. As a design science, teaching is inherently a creative process that benefits from innovation, experimentation and iterative redesign. At a research-intensive university, our teaching must also be alive to new developments and discoveries, and continually responsive to advances in knowledge.

As we present our students with more authentic and more challenging issues, this will demand from them more creative and experimental solutions, potentially leading to new lines of exploration. The intended result is an exciting mix of innovation and experimentation involving staff and students, as well as community and industry partners, that will help to drive all aspects of our mission as a university.

The third theme is a companion to the second and is the commitment to evidence, feedback and analysis. Feedback is important for both staff and students and for both learning and learning design. To the extent we can design effective sources of feedback, and subject that feedback to insightful analysis, link it to innovations in learning design and utilise the results to direct and redesign learning experiences, we will be well-placed to improve educational experiences and educational outcomes.

This theme encourages a more systemic understanding of the educational process, one that recognises the interdependencies of the educational process, systems of assessment, feedback and analysis, and the environment for learning, as well as their dependence on the system of professional learning and support for staff and the broader support services and enrichment opportunities for students.

An important corollary of this commitment to feedback will be to celebrate and reward teaching excellence, as a way of both recognising the exemplary efforts of individuals and promoting the value of teaching at the University.

The final theme is openness. In opening curricula to interdisciplinary problems, to questions of culture, values and ethics, and to issues of the contemporary world, we will create ongoing opportunities to test and understand the applicability as well as the limitations of disciplinary skills and knowledge, and to develop insights and approaches that are potentially novel to students, staff members and community experts alike.

1 For example, 90% of staff agreed that Fostering of teaching excellence should be a core strategic focus for the University and only 3% disagreed. The equivalent figures for Fostering of research excellence were 91% and 1% respectively. For students, Fostering of teaching excellence was the top priority, with 84% agreeing it should be a core strategic focus and only 3% disagreeing. The equivalent figures for Fostering of research excellence were 80% and 3% respectively.

2 For example, in ranking the University’s performance in eight current core areas of strategic focus, students placed Fostering of teaching excellence second last and staff placed it equal last.
If we can pursue these themes through the proposals presented in this paper, we will build an institutional culture of excellence, innovation, openness and responsiveness that will not only drive continuous quality improvement in the educational experiences and educational outcomes of our students but will also serve to foster in them those same values.

These values and aspirations resonate strongly with those proposed in Building a culture of research excellence, a companion to this paper, highlighting the close alignment of research and education.

The paper begins with a discussion of international and national trends in learning and teaching in higher education, and an analysis of the University’s current performance in education, taking account of available benchmark data. It then reviews feedback from staff and students on where opportunities for improvement exist. These observations inform a proposed vision for educational excellence at the University of Sydney.

A number of proposals for addressing the gap between our present state and this aspiration for excellence are then put forward for discussion, in five parts:

- **Educational approaches.** This first part sets out a series of evidence-based approaches to learning and teaching that engage and challenge students and have high impact in achieving learning outcomes, providing a strong foundation for graduates’ ongoing learning and for their transition to increasingly competitive, fluid and challenging work environments.

- **Enabling and recognising teaching excellence.** This outlines ideas for a refreshed professional learning environment to promote and enable outstanding teaching. Such an environment must be responsive to faculty needs, support strategic innovation and quality improvement, provide access to effective and appropriate professional learning opportunities, including for sessional and casual teaching staff, and ensure our commitment to educational excellence permeates our systems for the recruitment, confirmation, performance development, promotion and recognition of academic staff.

- **Evidence for learning and teaching: assessment, feedback, analytics.** This lays out opportunities and options for improving how we use assessment to provide feedback to students and staff on progress in learning as well as to provide certified evidence of the level of learning attained by each student. Critical considerations are to assure the integrity of assessment and reduce the volume of assessment while increasing its effectiveness.

- **The learning and teaching environment.** This proposes improvements to the University’s physical and virtual resources and infrastructure to better support formal classes and learning activities within courses and units of study, as well as ways to leverage the talented and diverse community of staff and students working across the breadth of the University’s expertise, in part by establishing an open learning environment.

- **The co-curriculum, the broader student experience and student support.** This discusses how we might better support the significant contributions to student learning that come from experiences outside the formal curriculum, as well as how we can improve student support services.

The next two sections of the paper discuss how implementation of the proposed strategies might be addressed and how progress might be measured. The final section presents important next steps and invites feedback to inform careful consideration of these proposals.
2 Context

2.1 Trends in learning and teaching in higher education

The higher education landscape is a complex and dynamic one, and this summary sketch cannot attend to every important detail. It is nonetheless helpful to understand the broad trends.

First, a significant context for our discussion of learning and teaching is the national debate on how to balance several competing priorities: increasing access to higher education, maintaining the quality of higher education, and limiting the public contribution to overall higher education and per student costs. Balancing these pressures is clearly a significant challenge in Australia and has underpinned the recent deregulation debate, but it is also an important issue in many other countries. These pressures are already exerting a strong influence on the funding of our educational programs.

Second, predictions of digital disruption in higher education have fuelled speculation of a significant shift in higher education models, with potential disruption to degree structures, university providers and the traditional campus-based educational activities of universities. New providers are offering targeted educational modules, often in online modes. Online models of graduate education have also emerged at prestigious institutions, from full-fee models that seek to reproduce small interactive classes online, to reduced-fee models relying on more scalable asynchronous learning designs and free or low-cost educational opportunities associated with MOOCs.

At the undergraduate level, the appeal of campus-based education as well as associated residential opportunities has so far remained strong, though educational approaches are undergoing transformation with a steady uptake of blended learning models in undergraduate campus-based programs. The promise of educational technologies is also beginning to be realised as an array of open educational resources and digitally-enabled learning activities enrich and diversify the on-campus educational experience for students, extend classes to a virtual world, and give rise to a new wave of experimentation.³

Academic and learning analytics⁴ are starting to play an important role on some campuses too, providing a capacity to create targeted interventions aimed at improving student retention at course level and learning within individual units of study.

Third, and related to the adoption of blended learning approaches just noted, is the adoption of more active pedagogical designs. Here the role of the teacher is to design, deliver and adapt learning experiences that guide, prompt and support students to actively discover or construct new learning as they engage in activities and interaction with learning resources, peers and/or staff members. This broad trend includes institutional commitments to ‘flipping the classroom’⁵ and making greater use of educational approaches that are enquiry-based, discussion-based, practice-based, studio-based, collaborative and networked.⁶

Fourth, national and international attention to student learning and post-graduation outcomes has intensified. There has been extended discussion in many countries of the importance of contemporary generic and employability skills and the extent to which students are acquiring them. In Australia, the Quality Indicators for Learning and Teaching (QILT) initiative,⁷ introduced this year, reflects a renewed commitment to transparency in reporting indicators of the student experience and graduate outcomes.

³ Examples include Arizona State University’s partnership with edX to offer an online first year at reduced cost, and the Minerva project that has built a substantially online program around a residential program enriched with experiential learning components.

⁴ Academic analytics involve the analysis of data held on university systems to characterise patterns of student engagement and learning at broad degree level and use these patterns to assist in understanding the potential impact and effectiveness of institutional strategies to advance engagement and learning. Learning analytics is similar, but typically analyses data in a more fine-grained way, such as at the level of individual learning experiences.

⁵ ‘Flipping the classroom’ entails moving from a model in which a lecture-based presentation is followed by individual learning exercises to one in which students prepare for class by reading/viewing core material and, in class, engage in interactive and discussion-based learning experiences.


Importantly, the recent revision of the Higher Education Standards has a clear focus on learning outcomes, and the Tertiary Education Quality and Standards Agency (TEQSA) has been charged with regulating the sector against these standards. As noted in our first discussion paper, *Developing a distinctive undergraduate education*, a focus on quality of outcomes has also led some universities to adopt particular commitments to high impact educational activities, such as undergraduate research projects and service learning.  

Finally, the various impacts of globalisation on the higher education sector have been the subject of widespread commentary. The competition to recruit talented students and staff is an increasingly global one. While student flows are well-known to be sensitive to university rankings, and the rankings to be reflective, in turn, of research standing, the ranking agencies themselves are beginning to explore additional metrics reflecting the quality of educational outcomes. University graduates are also now joining a more globalised labour market. In Australia and elsewhere, the labour market is increasingly competitive and is expected to become more so in response to structural shifts brought on by automation and globalisation.

There are three inescapable conclusions from these trends. First, the quality of higher education and its outcomes for graduates is becoming increasingly important (appropriately so). Second, higher education is becoming increasingly competitive. And third, even though their evolutionary trajectories are as yet unclear, the technology-enabled developments in education that are beginning to emerge are potentially transformational. These trends frame the discussion of our aspirations and strategies for learning and teaching at the University of Sydney.

### 2.2 Current performance in learning and teaching

As argued later (section 4.3), it is important that we make use of feedback on our educational performance. Although definitive measures of the quality of educational experiences and outcomes are not available, systematic information is nonetheless regularly collected and compiled on student retention, student perceptions of their experience, and graduate employment outcomes. Some of these sources of information are benchmarked nationally, allowing comparison with all Australian universities as well as with the research-intensive Group of Eight (Go8) universities.

These information sources are the Australian Graduate Survey (AGS), which comprises the Course Experience Questionnaire (CEQ) and the Graduate Destination Survey (GDS), and the more recently introduced University Experience Survey (UES).  

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9 The Times Higher Education ranking includes metrics related to student:staff ratios and internationalisation of staff and students, and the QS Group has been exploring the incorporation of indicators of graduate outcomes.

10 The AGS is an annual national survey of new graduates four months after they have completed their degree. It comprises the CEQ, which examines coursework graduates’ perceptions of their educational experience, and the GDS, which reports on whether graduates are employed, looking for work, or engaged in further study four months after completing their studies. Its required scales include Generic Skills and Good Teaching, and all students also report on a single item assessing Overall Satisfaction with the quality of their course. The UES is undertaken every September and samples first and later (usually final) year undergraduate students, gauging their learning experiences in five focus areas at the level of each program of study.
2.2.1 Retention rates

An important first observation is that undergraduate retention rates at the University of Sydney are high and stable; Table 1 shows the most recent data. This means our students generally move successfully from one year of their course to the next. Increased retention nonetheless remains a significant goal.

Table 1. 2013 retention rate for commencing bachelor students

<table>
<thead>
<tr>
<th>Retention rate*</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Go8 rank (/8)</td>
<td>National rank (/39)</td>
</tr>
<tr>
<td>All commencing bachelor students</td>
<td>88</td>
<td>4</td>
</tr>
<tr>
<td>Domestic commencing bachelor students</td>
<td>87</td>
<td>4</td>
</tr>
<tr>
<td>International commencing bachelor students</td>
<td>94</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Department of Education

* Retention rate for year(x) = the number of students who commenced a bachelor course in year(x) and continue in year(x+1) as a proportion of students who commenced a bachelor course in year(x) and did not complete the course in year(x).

2.2.2 Student satisfaction ratings

Our student satisfaction ratings are less positive. Results from the 2014 CEQ (Table 2) show that satisfaction ratings for University of Sydney graduates were generally 3-4% lower than the average satisfaction ratings nationally, and 2-3% lower than the Go8 average. This places us in the lower half of the Go8 distribution and in the lower quartile of the distribution for all Australian institutions.

Table 2. 2014 Course Experience Questionnaire outcomes for 2013 bachelor and postgraduate coursework graduates

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>Go8</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agreement (%)</td>
<td>Go8 rank (/39)</td>
<td>National rank (/39)</td>
</tr>
<tr>
<td>Overall satisfaction with quality of course</td>
<td>80</td>
<td>8</td>
<td>34</td>
</tr>
<tr>
<td>Generic skills scale¹</td>
<td>75</td>
<td>8</td>
<td>37</td>
</tr>
<tr>
<td>Good teaching scale¹</td>
<td>63</td>
<td>6</td>
<td>34</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning

These three CEQ core measures are used by all universities; other measures are optional.

1. Overall satisfaction is a single measure.

2. Generic skills scale comprises six measures: the course helped me develop my ability to work as a team member; the course sharpened my analytic skills; the course developed my problem-solving skills; the course improved my skills in written communication; as a result of my course, I feel confident about tackling unfamiliar problems; my course helped me to develop the ability to plan my own work.

3. Good teaching scale also comprises six measures: staff put a lot of time into commenting on my work; teaching staff normally gave me helpful feedback on how I was going; teaching staff of this course motivated me to do my best work; lecturers were extremely good at explaining things; teaching staff worked hard to make their subjects interesting; staff made a real effort to understand difficulties I might be having with my work.
The September 2014 University Experience Survey (UES) outcomes provide a more recent view of first and final year undergraduate students’ perceptions (Table 3). In many focus areas, satisfaction among University of Sydney students is again low relative to students at Go8 and all Australian universities, in particular, in Learning Resources and Student Support.

More positively, in the focus area of learner engagement, our students’ satisfaction was around the upper quartile of the national distribution. This improvement is encouraging and serves as an excellent foundation for a renewed focus on interactive and authentic learning experiences.

Table 3. 2014 University Experience Survey outcomes (first and final year undergraduate students)

<table>
<thead>
<tr>
<th>University Experience Survey Focus area*</th>
<th>% satisfied</th>
<th>Go8 rank (/8)</th>
<th>National rank (/39)</th>
<th>% satisfied</th>
<th>% satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner engagement (LE)</td>
<td>65</td>
<td>2</td>
<td>10</td>
<td>64</td>
<td>61</td>
</tr>
<tr>
<td>Teaching quality (TQ)</td>
<td>81</td>
<td>6</td>
<td>26</td>
<td>81</td>
<td>82</td>
</tr>
<tr>
<td>Learning resources (LR)</td>
<td>82</td>
<td>7</td>
<td>35</td>
<td>85</td>
<td>86</td>
</tr>
<tr>
<td>Student support (SS)</td>
<td>62</td>
<td>8</td>
<td>38</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td>Skills development (SD)</td>
<td>81</td>
<td>2</td>
<td>23</td>
<td>80</td>
<td>81</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning
* A detailed explanation and breakdown of these focus areas is given in Tables A1 to A5 in the Appendix.

A detailed analysis of the UES focus areas (see Appendix) suggests that the University is succeeding in promoting interaction among students and that students find their teachers intellectually stimulating. Our students are less positive, however, about other aspects of learning and teaching. On average, they are less satisfied with the development of their problem-solving and written communication skills than students at other institutions, and with their interaction with staff and with the level of challenge in assessment tasks.

Our students are also less positive than those at other institutions about many aspects of student support, especially careers advice, support for development of skills in English language, administrative systems and support services. In addition, our students are less satisfied than students nationally with the formal and informal spaces for learning and teaching available to them and with informal interaction.

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11 Compared to the national average, the percentage of University of Sydney students satisfied with problem solving and written communication skills is 2-4% lower; for satisfaction with interaction with teachers and level of challenge to learn in assessment tasks, it is 3-5% lower.

12 Compared to the national average, 11-12% fewer Sydney students are satisfied with the availability and helpfulness of careers advice, 9% fewer with support for English language skills, 7-9% fewer with administrative systems and student services, 8% fewer with the quality of teaching spaces, and 5% fewer with student spaces and common areas.
2.2.3 Employment outcomes

According to the 2014 GDS, University of Sydney full-time employment outcomes four-months post-graduation (Table 4) are 3-4% below the Go8 average and just below the national average.

Table 4. 2014 Graduate Destination Survey: Graduates in full-time employment, as a proportion of graduates available for full-time employment

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>Go8 average</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Go8 rank (1/8)</td>
<td>National rank (1/39)</td>
</tr>
<tr>
<td>Bachelor degree graduates in full-time employment</td>
<td>63</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Postgraduate coursework graduates in full-time employment</td>
<td>69</td>
<td>6</td>
<td>28</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning

However, since a relatively large proportion of Sydney bachelor graduates proceed to further study (shrinking the pool of those in the employment market), it is valuable to examine the percentage of the whole graduating cohort who are not employed full-time but who are actually seeking full-time work. This figure is at the Go8 and national average (see Table 5).

Longitudinal data (not shown here) indicate that employment rates among University of Sydney bachelor degree graduates have been trending downwards over the past three years, in line with the overall trend amongst Australian universities, whereas employment rates for postgraduate coursework graduates have been stable, against the national downward trend.

Table 5. Bachelor degree graduates seeking full-time employment, as a proportion of the total cohort of graduates

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>Go8 average</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Go8 rank (1/8)*</td>
<td>National rank (1/39)*</td>
</tr>
<tr>
<td>In part-time work, seeking full-time work</td>
<td>10</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Not working, seeking full-time work</td>
<td>9</td>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning. *Rank 1 = lowest % of graduates seeking full-time work.

Taken together, the indicators of student retention, student perceptions of their experience, and graduate employment outcomes, suggest that University of Sydney students are progressing well through their courses and there are some encouraging signs of improvement in several important learning and teaching indicators.

Nonetheless, there remains an urgent need to improve the educational experience, including the broader services that support students to engage effectively with learning. There is also considerable scope to improve graduate outcomes, including through preparation for transition to work.
2.3 Staff and student views of opportunities for improvement

A variety of recent sources provide more specific staff and student views on aspects of learning and teaching at the University of Sydney, particularly opportunities for improvement. A summary of views is presented in Table 6, offering some important insights. Views are presented separately for staff and students and classified by the extent to which they are shared, related, or distinctive to each group.

Table 6. Staff and student views on opportunities to improve learning and teaching

<table>
<thead>
<tr>
<th>Staff views</th>
<th>Student views</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shared</strong></td>
<td><strong>Shared</strong></td>
</tr>
<tr>
<td>- Increase focus on excellence in teaching and learning&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>- Increase focus on excellence in teaching and learning&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Increase focus on optimal student experience&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- Increase focus on optimal student experience&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Value teaching and research equally&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- Value teaching and research equally&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Increase recognition of excellent teaching&lt;sup&gt;a&lt;/sup&gt;</td>
<td>- Increase recognition of excellent teaching&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Increase interdisciplinary learning experiences&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>- Increase interdisciplinary learning experiences&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Increase experiential learning opportunities, including use of authentic assessment, options for community and industry projects, internships/placements/work experience&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>- Increase experiential learning opportunities, including use of authentic assessment, options for community and industry projects, internships/placements/work experience&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Engage educationally with community and industry&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>- Engage educationally with community and industry&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Provide faster, more integrated and more functional enterprise learning systems&lt;sup&gt;c&lt;/sup&gt;</td>
<td>- Provide faster, more integrated and more functional enterprise learning systems&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Provide better technological support for student collaboration&lt;sup&gt;c&lt;/sup&gt;</td>
<td>- Provider better technological support for student collaboration&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Related</strong></td>
<td><strong>Related</strong></td>
</tr>
<tr>
<td>- Prioritise student engagement and active learning&lt;sup&gt;d&lt;/sup&gt;</td>
<td>- Increase high quality face-to-face interaction with staff&lt;sup&gt;a,c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Develop a more structured and coherent curriculum&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Develop a more relevant, contemporary curriculum&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Integrate pedagogical and technological support&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Ensure staff proficiency and consistent use of enterprise learning systems&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Provide more timely, targeted and in situ support&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Provide greater access to technology-enabled interactive learning experiences&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Provide support for creation of more technology-enabled interactive learning experiences&lt;sup&gt;c&lt;/sup&gt;</td>
<td>- -</td>
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<tr>
<td><strong>Distinctive</strong></td>
<td><strong>Distinctive</strong></td>
</tr>
<tr>
<td>- Facilitate cross-faculty teaching collaboration&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Increase access to the learning management system&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Increase access to learning analytics tools and data&lt;sup&gt;a,c&lt;/sup&gt;</td>
<td>- Personalise the experience of university systems&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Support the development of evidence-based practice&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Provide more flexible timetabling options&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>- Support the development of evidence-based practice&lt;sup&gt;b&lt;/sup&gt;</td>
<td>- Increase support for students facing financial and other difficulties&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Source: * = April 2015 strategy survey, † = December 2014 response to Towards a Distinctive Sydney Education, ‡ = October 2014 LMS Survey, †† = April 2015 feedback on Lecture Capture Opt-Out Pilot

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13 Sources as below:

a Responses to the University-wide survey of April 2015.
b Feedback in December 2014 on a University-wide discussion paper released in October 2014 entitled Towards a distinctive Sydney education, to which all staff were invited to respond. The paper itself, as well as a brief summary, are available at https://intranet.sydney.edu.au/news-initiatives/education.html.
c Staff and student feedback on the University’s virtual learning environment via a survey of the University’s Learning Management Systems in October 2014. The survey was conducted between 20 October and 3 November 2014 and was open to all university students and staff. Respondents included 6448 students (79% undergraduate, 21% postgraduate), 282 academic staff and 72 professional staff. A summary of responses was reported to the SEG Education Committee in March 2015. (d) Since March 2015, staff have been invited to provide feedback to the DVC Education on the Lecture Recording Opt-Out Pilot; see http://sydney.edu.au/news/staff/2576.html?newsstoryid=14853.
The views of staff and students resonate deeply. Both groups place high value on teaching, seek excellence in their teaching and learning and the student experience, and aspire to an equal standing for teaching and research while perceiving that there is currently a gap in this respect between institutional values and their own.

Staff and students also share a common vision for an educational experience of high quality: engaged intellectual interaction and engagement with staff and other students; a collaborative learning environment rich in opportunities for community- and industry-engaged experiential and interdisciplinary learning; and a technological environment that provides not just fast, ubiquitous access to the best available learning resources but a virtual extension in time and space of the face-to-face classroom-, community- and industry-based interactions at the heart of the educational experience. Students, especially, seek greater collaboration and stronger connection with each other as class participants; and they see that the enterprise learning systems could contribute to this virtually.

Staff and students alike also recognise the value of high quality technology-enabled interactive learning resources and access to effective, targeted and timely professional staff learning opportunities and support. Both groups seek a faster, more seamless, and more functional experience of enterprise learning systems. They also recommend a refreshed curriculum, with staff seeking greater coherence and a structure that will assure learning outcomes, and students seeking learning outcomes relevant to their future lives and careers. The Graduate Qualities proposed in Developing a distinctive undergraduate education and the associated curriculum framework attempt to integrate these two aspirations.

A concern distinctive to staff is the need to remove the barriers, real or perceived, to cross-faculty collaboration in teaching. Staff are also keen to explore the potential of learning analytics for providing richer and real-time feedback on student engagement and learning.

For their part, students are very clear about their desire for a consistent set of learning resources available through enterprise learning systems. They would also like the learning management system (LMS) to be more open in several respects: more detailed course outlines to be available prior to enrolment in a unit of study, to inform the choice process; and ongoing access to resources for units of study they have already completed, since they see these resources as relevant and useful for later units of study.

Students also seek systematic and consistent use of assessment-related functions within the LMS, including more complete and reliable online access to grades and grade distributions and the capacity to upload all assignments via the LMS in a consistent fashion (for example, through Turnitin). They desire a more seamless and integrated experience across all of the University’s enterprise systems, affording easier access to library holdings and a personal timetable and calendar. In recognition of the challenging financial circumstances for many students, they also seek timetabling flexibility and support where financial hardship arises.

We pick up many of these themes in the commentaries of staff and students in Section 4 below. This brief summary of staff and student views points towards a shared educational aspiration.

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14 Specifically, they seek an LMS presence for each unit of study of the following: unit of study outlines; names and contact information for all staff; assessment details and dates; formative assessment opportunities such as weekly practice quizzes; uploaded lectures; class resources including bibliographies and direct links to key readings; links to external resources including important databases; resources for tutorials and workshops as well as lectures; past exam papers; and additional resources and further reading for enthusiasts.
If we are to propose strategies for bridging the gap between an aspiration for educational excellence and present state, then we need to set out clearly the form of educational excellence to which we aspire.

This characterisation is the topic of this section and draws on the themes of the prior two sections. In the sections to follow, we discuss strategies for achieving this aspiration and the indicators by which we can measure our progress.

We propose three broad aspects of educational excellence.

The first is the endpoint of students' educational experience: excellence of educational outcomes. Our graduates should demonstrate the University's agreed graduate qualities to a high standard, and hence be superbly prepared for whatever learning, life and work experiences are to follow. As a consequence, graduates should be successful in accessing further study opportunities and rewarding career paths, and in contributing to their communities.

The second is excellence of the educational experience itself. This is essentially about the roles of and the interactions between staff and students in the learning process, and it is proposed as a separate criterion for excellence for two reasons. Firstly, the impact of teachers, including their capacity to engage students productively in the process of learning and discovery, is very powerful. Secondly, it is vitally important that students increase their mastery of the meta-cognitive skills that underpin self-directed learning. Students should therefore be actively engaged in learning; challenged, guided and supported to reach a high standard of learning; and be increasingly aware of and responsible for their learning with each passing year of tertiary study. To achieve this requires a preference for educational approaches that promote engagement and enquiry and that challenge students with novel problems and issues at every stage of the educational process.

The third is excellence of the educational environment. This includes the physical spaces and equipment relevant to learning and teaching activities, the virtual learning environment and its constituent tools, platforms and resources, and the broader supports for learning and teaching. These broader supports include services promoting wellbeing and academic enrichment activities for students, and professional learning and support for teaching quality improvement and innovation for staff. An excellent environment will be one that supports a commitment to working together to achieve excellence in the educational experience and educational outcomes, seeks continuous improvement by engaging in experimentation, innovation and research, monitors indicators of success, and celebrates excellence wherever it is achieved.

These three aspects of educational excellence are deeply entwined in the learning process. As staff and students are well aware, excellent outcomes are achieved by a continuous and well-coordinated sequence of learning experiences. That sequence involves expert guidance through well-designed interactive learning activities that are rich in collaboration and feedback, open to iterative redesign, enlivened by external engagement, and supported by outstanding learning resources and a virtual extension of the classroom that maintains each student’s connection to the class and promotes ongoing interaction.

If we commit to achieving these three forms of excellence, we will build the deep institutional commitment to fostering and celebrating educational excellence that the University community collectively seeks.
We turn now to strategies for achieving these forms of excellence, considering five domains in turn.

The first domain is the educational approach, and we consider the choices that academic staff make in designing a sequence of learning activities to shape the learning process. These choices have a powerful impact on student engagement, student learning and student outcomes and are a natural starting point for the strategic discussion. We propose broader uptake of evidence-based designs that promote enquiry, collaboration and challenge, continuing but extending the commitment of the 2011-2015 Strategic Plan to ‘engaged enquiry’ and emphasising the different forms of connectedness that underpin it: the connection of education and research; the connections among fields of study; and the connection of learning to community. We also make some specific propositions intended to encourage this uptake and support specialised components of the curriculum framework proposed in Developing a distinctive undergraduate education, the first discussion paper.

The second domain is the system of professional development, expert support and recognition that builds and celebrates teaching excellence. Professional development and expert support play a key role in developing understanding and skill in effective educational practice, and it is vital that they are as well-targeted and effective as possible.

The third domain is that of feedback. Feedback is broadly construed to encompass assessment and analytics and is singled out for consideration here because of its role in informing staff and students about the effectiveness of their respective efforts in the educational process. A more systematic approach to feedback systems is proposed.

The fourth consideration is the physical and technological learning environment within which learning and teaching takes place. It is proposed that a number of features of this environment be prioritised for development because of the support they can offer to educational approaches encouraging enquiry, collaboration and challenge.

Finally, we consider the support environment for the broader student experience, including the co-curriculum and student services. We emphasise the importance of many co-curricular activities for developing the proposed qualities of the University of Sydney graduate and recommend drawing many of these activities into the curriculum as proposed in Developing a distinctive undergraduate education. We also propose specific additional investment in careers support as part of an integrated framework of activities that develop, assess, and demonstrate the qualities of our graduates and support transition to employment or further study.
4.1 Educational approaches

Educational excellence depends, in large measure, on the collective skills of university staff. This is not just in terms of their mastery of the relevant fields of study but also of their skills in curriculum and learning design at both unit of study and program levels and their passion and commitment to leading student learning through their educational practice.

To achieve our educational aspirations, it will be important to adopt educational approaches that not only have high impact in achieving desired learning outcomes, but also engage and challenge students and serve as a springboard for graduates’ ongoing learning and transition to increasingly competitive, fluid and challenging work environments.

Teaching has been aptly characterised as a design science: the task of the teacher is to create a sequence of experiences that promote learning. The design challenge applies at multiple levels – whole of degree, sub-degree components such as programs and majors, and individual units of study. It is therefore necessarily a challenge in both creativity and coordination. While the required coordination can be accomplished, in part, by ensuring an appropriate mapping of intended learning outcomes from course to unit of study level, there is also a deeper coordination challenge requiring a more nuanced alignment of learning experiences that build an integrated body of knowledge and skills across units of study. If we are to develop an outstanding educational experience, we will need to view our educational goal as a fundamentally shared commitment, and work openly and collaboratively, as well as creatively and iteratively, to achieve it.

While each design challenge is unique, certain educational approaches recur in practice because of their demonstrated effectiveness, and these include so-called enquiry-based, discussion-based, studio-based, practice-based, collaborative, networked approaches. The commitment to ‘engaged enquiry’ in the 2011-2015 Strategic Plan encourages these interactive, collaborative and enquiry-based learning strategies and has framed some recent approaches to teaching and professional development for teaching. These approaches can, in principle, be adapted to diverse units of study, as many award-winning teaching staff at the University have demonstrated. In addition, a number of staff have been experimenting with ‘flipped classroom’ forms of these approaches, and have achieved some of the learning gains also demonstrated in the research literature.

But to what extent has this institutional commitment to ‘engaged enquiry’ led to broad shifts in educational approach at the University? Is there evidence of systematic adoption of enquiry-based, discussion-based, practice-based, studio-based, collaborative and networked learning designs? Despite sustained work in several faculties (see Box 1 for an example), some of the responses of our students to the University Experience Survey suggest that a more systematic commitment is still required if we are to promote student engagement and student learning through the adoption of these forms of evidence-based practice.

This is not to suggest adoption of a single common practice, but rather to encourage each academic and each teaching team to develop designs that are both creatively theirs and guided by evidence, and that operate at the level of unit of study as well as at the level of broader curriculum components. The program-level aspect of this task is vital: an outstanding educational program will present a coherent curriculum and an aligned set of educational designs to achieve learning outcomes at the level of all relevant course components, whether unit of study, major, minor, stream or degree.

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18 ‘Flipping the classroom’ entails moving from a model in which a lecture-based presentation is followed by individual learning exercises to one in which students prepare for the class by reading/viewing an account of core material and engage in interactive and discussion-based learning experiences in class.

19 University of Sydney student responses to the items ‘Participated in discussions online or face-to-face’, ‘Teachers engaged you actively in learning’ and ‘Teachers set assessment tasks that challenge you to learn’ all improved from 2013 to 2014, but remain below the national average in 2014 (Table A3).
Box 1. An enquiry focus for first-year laboratory classes in the Faculty of Science.

Over the last five years, the Faculty of Science has systematically revised the first year laboratory experience by replacing ‘recipe-driven’ experiments with more open and authentic ‘enquiry’ experiments. The intention of the enquiry experiments is to engage students’ interest through a genuine research-enriched experience while also building students’ research skills in:

- gathering, synthesising and critically evaluating information from a range of sources
- designing and planning an investigation
- selecting and applying practical and/or theoretical techniques or tools in order to conduct an investigation, and
- collecting, recording, interpreting and drawing conclusions from scientific data.

The educational effectiveness of each new experiment was carefully evaluated and iteratively improved, and the outcomes have been published in educational research and science education journals.

Of course, introducing new, more interactive learning experiences into existing units of study may entail other changes to existing learning designs, and the use of pre-readings, pre-recorded videos and short diagnostic tests of understanding of core concepts and themes is increasingly common. Preceding a plenary class account of an issue with an opportunity for prior group discussion of the issue, or introducing opportunities for ‘productive failure’, can also be effective strategies for increasing engagement and learning.20

Importantly, a change in educational approach is intended to – and will need to – increase the engagement of students in class activities, and we need to communicate clearly to students an appropriate and compelling set of expectations and requirements.

Whatever evidence-based approach we adopt, it is worth noting that most will require creative and effective use of technology. If we are to free up time to engage more interactively with students, we need to be efficient and effective in the ways we create and make use of learning resources, activities and assessments and support productive interaction. Technology offers considerable promise in this regard21 and we pick up in a later section (Section 4.4) the consequences for the University’s technological environment of a commitment to interactive and enquiry-based designs.

In addition to the broad challenge just discussed of identifying effective educational approaches for units of study and larger components of a degree program, there are some specific educational challenges associated with components of the curriculum framework proposed in Developing a distinctive undergraduate education. We therefore turn to consider some of these challenges.

4.1.1 The first year

First year, particularly the first semester of enrolment, marks a significant transition for most students, and poses a challenge and an opportunity for academic staff. The early units of study undertaken in a degree set students’ expectations for university study, provide exposure to potentially new fields of study, create engagement with a new form of learning environment and, ideally, include early diagnostics and opportunities for further development of core knowledge and essential skills in communication, analytical thinking, problem solving and foundational knowledge. They also present an opportunity to introduce students to the process of discovery and inspire a different approach to learning. Many first year classes are large, and this presents an additional challenge but also an opportunity for innovation in teaching. Indeed, innovative and effective methods for engaging and teaching large classes already exist, and we can learn from them22.


21 Examples of potentially valuable technologies include: electronic and multimedia resources including eBooks; collaboration tools; electronic notebooks; audience-response systems; assessment systems; videoconferencing tools; simulation; game-based learning; adaptive learning platforms; access to remote data, equipment and software; and immersive 3-D environments.

22 For example, see http://www.olt.gov.au/resource-library/text=teaching large classes
It is important that we invest carefully in the design of these early university learning experiences, taking advantage of evidence on effective first-year practice and ensuring that excellent teachers are supported to provide students with an effective transition to university learning. We also need to determine the most effective strategies for engaging students in the first year, setting expectations for participation and challenge, and bringing alive the excitement of learning at a research-intensive university (see, for example, Box 2).

Key questions are: how to invest most effectively in supporting outstanding teaching staff and well-prepared cohorts of tutors to manage large, core, first year classes; and how to utilise effectively a new and more versatile kind of learning opportunity, supported by the proposed Open Learning Environment (OLE), that is available to all students and brings together staff to lead enquiry into contemporary issues and problems in domains of shared research expertise.

**Box 2. Vivid 2015: Intercellular and Machine Cells.**
The University’s participation in Vivid 2015 included a number of collaborative cross-disciplinary staff and student projects. One, *Intercellular*, explored ideas of light in the International Year of Light and involved staff and students from the University as well as local artists and staff and students from the Eora TAFE. Another, *Machine Cells*, sought to represent ways in which single cells produce and respond to insulin. Participating staff in these projects included Professor Phil Poronnik, School of Medical Sciences, Dr Caitlin de Bérigny, Faculty of Architecture, Design and Planning, and Dr Ivan Zavada, the Sydney Conservatorium of Music.

### 4.1.2 The development of broader skills

The graduate qualities proposed in *Developing a distinctive undergraduate education* include a set of ‘broader skills’ that are developed within but apply well beyond specific disciplinary contexts. These include academic integrity, and skills in critical thinking, problem solving, communication, information literacy, data science and ‘inventiveness’. The development of these skills will require a carefully designed sequence of learning experiences that run across units of study and are devoted to skill-building; many of these experiences will be embedded across core units of study within majors or programs. Opportunities for further enrichment will be offered through electives, as part of the proposed Open Learning Environment, and through co-curricular offerings. While some of the skills targeted for development such as critical thinking, written communication and academic integrity have been the focus of course design for some time, and we have developed some expertise in their development, others such as oral communication, problem solving, new forms of information literacy, data science, creativity and design thinking, are less well-developed within current curricula, and are likely to need focused attention and/or expert professional support. In some cases, expertise will be focussed in one or more disciplines or professions (for example, data science, creativity and design thinking), and we may need to resolve how to build broader capacity by sharing this knowledge and expertise across the University in ways that appropriately value such sharing.

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24 This was proposed in the first discussion paper, Towards a Distinctive Undergraduate Education, and is discussed further in ‘The learning and teaching environment’ in Section 4.3 of this paper.
4.1.3 Cultural competence

The University seeks to be a diverse and inter-culturally skilled community. Developing a distinctive undergraduate education highlighted our commitment to equip graduates with the skills to participate in a more dynamic and uncertain world of work and in increasingly globalised communities. In particular, we recognise that graduate qualities should include an understanding of and respect for cultural and social differences and the skills to participate effectively in diverse interpersonal and professional settings. Through the whole-of-university strategy Wingara Mura-Bunga Barrabugu (‘thinking path to make tomorrow’), the University has already begun to embed cultural competence in pedagogy and curriculum and to lift the profile of Aboriginal and Torres Strait Islander cultures, experiences and issues in the learning and teaching environment. (See Box 3, for progress in the Faculty of Veterinary Science). The strategy also extends to other cultures in our region and beyond.

Rolling out cultural competence requires a paradigm shift in how we teach and expect students to learn. Integral to the strategy is an understanding that it is everybody’s responsibility to embrace the challenge of developing an organisational and learning environment that allows cultural competence to flourish. With this in mind, the University must take a multi-faceted approach to developing the necessary skills within its teaching staff and actively engage in building a safe learning environment for all students. Leading and guiding this multi-faceted approach is the National Centre for Cultural Competence, which is developing new models and resources to support a shift to a more collective, relational model for learning and teaching. Relational learning and teaching is a strategy cultivated through Indigenous and culturally diverse peoples’ knowledge systems where sharing and respect flourish. Skills such as listening and hearing, and respectful and intelligent discussion, are developed, and key principles of cultural competence such as critical thinking and self-reflection are scaffolded across the curriculum.

Encouraging students to access the rich cultural and language offerings in the Faculty of Arts and Social Sciences including through the Diploma of Languages is also important, as is building further opportunities for experiential learning in culturally diverse settings. Key means to facilitate this include: the development of culturally rich experiential learning opportunities in conjunction with community and industry organisations in Australia and overseas; the development of cohort-based exchange arrangements with international universities in Australia and overseas; increased support for and availability of intensive mobility experiences; the development of dual and joint educational offerings with international universities; and the opening of summer and winter periods to all students for intensive cultural learning experiences.

Rolling out cultural competence requires a paradigm shift in how we teach and expect students to learn. Integral to the strategy is an understanding that it is everybody’s responsibility to embrace the challenge of developing an organisational and learning environment that allows cultural competence to flourish. With this in mind, the University must take a multi-faceted approach to developing the necessary skills within its teaching staff and actively engage in building a safe learning environment for all students. Leading and guiding this multi-faceted approach is the National Centre for Cultural Competence, which is developing new models and resources to support a shift to a more collective, relational model for learning and teaching. Relational learning and teaching is a strategy cultivated through Indigenous and culturally diverse peoples’ knowledge systems where sharing and respect flourish. Skills such as listening and hearing, and respectful and intelligent discussion, are developed, and key principles of cultural competence such as critical thinking and self-reflection are scaffolded across the curriculum.

4.1.4 Interdisciplinary learning experiences

To develop interdisciplinary effectiveness, we need to offer opportunities for students to engage in interdisciplinary problem-solving. Such opportunities have the added benefit of further developing critical thinking skills. They could be supported by a range of educational approaches, including the use of case-based and problem-based learning designs; interdisciplinary units of study built around interdisciplinary problems, themes or issues; and interdisciplinary projects requiring a team of students with different disciplinary backgrounds to work on complex problems; and inter-professional learning experiences and/or units of study designed to provide experience of problem solving in realistic inter-professional settings. For an example, see Box 4.

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Box 3. Cultural competence in the Doctor of Veterinary Medicine.

Associate Professor Jaime Gongara, Sub Dean, Indigenous Strategy in the Faculty of Veterinary Science has led a project to embed within the Doctor of Veterinary Medicine a basic understanding of the history and culture of Aboriginal and Torres Strait Islander peoples and of the ways in which culture and belief systems influence the delivery of veterinary care.

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25 For example, through the opportunities being created with Aboriginal community controlled organisations and international indigenous groups by the Deputy Vice-Chancellor (Indigenous Strategy and Services) and others, through the New Colombo Plan, and taking advantage of the University’s new facility in Suzhou in China.

26 Interdisciplinary units of study could connect students to researchers who have successfully pitched a seminar topic drawing on, for example, the University’s multidisciplinary research priorities in obesity, diabetes and cardiovascular disease; infectious diseases; China studies; and Southeast Asia studies.
Box 4. Interdisciplinary experiences.

- NUTM3004 Metabolic Cybernetics is an interdisciplinary unit of study coordinated by Dr Kim Bell-Anderson, School of Molecular Bioscience. It addresses the complexity of the problem of obesity and related disorders and how this relates to our environment. Leading research academics give seminars relating to the question ‘Why do some people get fat and not others?’ and how their research contributes to the field. Mid-semester, research teams of students form and are provided with ‘big data’ to learn how to manage, analyse, investigate and visually represent significant results. Data analysis sessions are supported by tutorials and key academics serve as group mentors. The unit aims to reflect the research approach in the CPC and is designed to translate the broad research aims of the CPC into the undergraduate curriculum. Key learning outcomes include: a multi-disciplinary perspective of the problem; big data analysis; and skills to represent and visualise complex data.

- The Sydney South East Asia Centre’s interdisciplinary field schools, supported in part by New Colombo Plan funding, have included students from disciplines in agriculture, architecture, Asian studies, business, education, geography, Indonesian studies, political economy and work and organisational studies. Future field schools are slated to involve the disciplines of nursing, pharmacy, resource economics, media and communications, anthropology, and engineering and IT.

An exciting broader option is a new 2000- or 3000-level unit of study tentatively titled the Sydney Research Seminar (SRS) and jointly sponsored by the Research and Education portfolios; see Box 5. The development of effective strategies for assessing interdisciplinary experiences will be particularly important and will require defensible means of assessing the extent to which students can: draw on their disciplinary skills and knowledge to communicate effectively in interdisciplinary settings; understand and work with the different conceptual forms, knowledge bases, questions and modes of enquiry specific to each discipline; and contribute in settings outside those for which their discipline has prepared them.

Box 5. Sydney Research Seminar.

The Sydney Research Seminar is proposed as a unit of study comprising a set of sections, each on different interdisciplinary issues or problems and each involving a cross-disciplinary group of students and staff in exploration of the issue or problem. The sections could share the same generic assessment requirements but the curriculum and learning activities would be fluid and jointly created by seminar participants in the course of the seminar, allowing students to be active participants in the process of exploration of a new topic and in the framing and refining of valuable questions that advance exploration. The topics for sections would be selected each year through a competitive process and each new section would attract some funding to support initial design and compilation of resources.

4.1.5 Group work

Many intercultural and interdisciplinary learning experiences are likely to entail group work in some form. Although the capacity to collaborate effectively is a vital skill for the contemporary world, many students are sceptical of the value of some of the group work they encounter. It is important, therefore, to ensure that learning designs incorporating group work are purposeful and effective and that the learning outcomes and assessment regimes associated with all forms of collaborative learning are robust and clearly communicated to students.

The 2015 Inter-professional learning program (Box 6) illustrates some of the issues and ways in which they can be addressed. It may also be necessary to adequately prepare students for the challenges they may encounter in group learning settings. Importantly, we should develop evidence-based guidance on effective group-based and other collaborative learning designs if we are to ensure students acquire the graduate qualities.

4.1.6 Research opportunities

The impact and value of research opportunities for undergraduate and graduate students have been well demonstrated in the literature, and the University already offers a number of such opportunities; see Box 7, for example, for opportunities in the School of Physics. An important question is how to increase the opportunities on offer, particularly in a curricular rather than co-curricular form. One option is to ensure that individual- or group-based research units of study are available within all undergraduate and graduate coursework degrees, and to ensure adequate mechanisms, policies and processes for funding, supervising and assessing the learning activities.

Box 7. Undergraduate research opportunities in the School of Physics.
The School of Physics, like a number of other schools, departments and disciplines in the university, offers various opportunities for an undergraduate student to participate in research in one of the school’s research groups, including:
- the Talented Student Program, an introduction to the school’s research through targeted activities in the Winter break
- summer scholarships, supporting research participation by high performing undergraduate students, usually for six weeks within the summer vacation period
- third year project, an opportunity to complete a supervised project within a formal unit of study
- honours project, a larger (24 credit point) supervised research project at fourth year level.

4.1.7 Entrepreneurship opportunities

Exactly the same questions arise for entrepreneurship opportunities as for research. Several excellent models for offering entrepreneurship opportunities within the curriculum already exist within the university (Box 8), and some operate at considerable scale; for non-curricular activities, see Box 16.

Box 8. Entrepreneurship and innovation opportunities within the curriculum.
The University of Sydney Business School Entrepreneurship and Innovation program, under the direction of Dr Richard Seymour, offers a suite of curricular opportunities. These include the RARE program, an initiative that connects students with remote and rural enterprises in Australia. Students undertake projects designed to deliver practical and desirable recommendations that are supported by rigorous academic evaluation and relevant evidence.

4.1.8 Supporting industry and community engagement

It was proposed in Developing a distinctive undergraduate education that the University make a significant commitment to industry- and community- engaged learning. To achieve our ambition for experiential, project-based learning in community and industry settings at the scale proposed, we will need to build on the work of the Careers Centre and many faculty staff to support an expanded and much deeper set of external relationships, including those underpinning the illustrative opportunities presented in Box 9. These relationships will ideally support a range of forms of educational engagement, including site visits, guest lectures, employer discussion panels, industry engagement in course advisory committees, community or industry projects, internships and placements, and industry-based higher degrees by research.

We will also need deeper engagement at the disciplinary level as well as some degree of central coordination: disciplinary engagement is vital for developing meaningful forms of engagement and central coordination is vital because meaningful engagement often involves more than one discipline or field. Some kind of hub-and-spoke structure will likely be necessary to achieve a fruitful blend of disciplinary engagement and central coordination.

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28 By ‘community and industry engagement’ we refer to engagement with all non-University sectors and organisations including business, industry, not-for-profit and other community organisations, and government.
Effective coordination would support many things: the sharing of good practice and learning; the potential for multidisciplinary engagement; the development of problem-based, issues-based, or case-based approaches to be used within the curriculum, including for project work; the expansion of internships and practicums; and opportunities for real and virtual site-visits, field trips and engagement with clients in the form of simulations and role-play.

It would also ensure a professional and partner-centric approach to external organisations on the University’s part – the single ‘front door’ for which industry and community organisations have often signalled a preference – and would enable better integration with research activities involving these community and industry partners.

A variety of successful industry and community engagement initiatives are already in place at the University. They include the following:

− The Law School’s Social Justice Program, directed by Professor Peter Cashman, offers opportunities for students to work with organisations on real world cases as they also participate in a structured seminar program on social justice issues and public interest law.

− Dr Eric Knight of The University of Sydney Business School coordinates the MBA Business Capstone. This requires groups of students to build prototype products and services that are aligned with the strategic roadmap of corporate partners (see http://www.afr.com/leadership/management/business-education/mba-students-build-real-life-products-for-swiss-re-20150416-imnczj).

− The Faculty of Arts and Social Sciences offers the ArtSS Career-Ready program. The program includes professional development workshops and competitive paid work placements exclusive to FASS students.

− The School of Chemical and Biomolecular Engineering has been offering a Major Industrial Project Placement Scholarship (MIPPS) Scheme since 2000. The scheme involves the completion of a six-month full-time project identified as being of value to the industry partner, and supervised by an academic within the school.

− The University of Sydney Business School’s Industry Placement Program offers a selective placement program for undergraduate and graduate business students to work in Sydney-based firms, international firms, and government and not-for-profit agencies. The selection process involves an academic threshold and an evaluation through an Assessment Centre for business acumen, teamwork and leadership, business communication and critical thinking.

− The School of Information Technologies offers capstone units of study that require groups of students to create software solutions for authentic clients.

− Professional programs in the health disciplines include a variety of novel placement models, including those involving community organisations in Broken Hill and the University Department of Rural Health in Broken Hill.

In summary the University should, as part of its ongoing activities:

− make substantially greater use of evidence-based learning designs that promote learning through active and collaborative enquiry, and

− develop and take up evidence-informed advice on effective approaches for: first-year units of study; group work; ‘broader skills’ development; cultural competence; and interdisciplinary learning.
In terms of initiatives for discussion, the following is proposed:

**Proposition 1**

That the University:
- promotes greater educational engagement with community and industry by bringing authentic contextualised disciplinary and multi-disciplinary problems into class learning activities
- creates a project funding stream for 2016-2019 to support curriculum renewal and redesign projects within the University’s programs, especially at undergraduate level
- supports the proposed Sydney Research Seminar as a research-intensive educational opportunity for staff and students
- supports through the Educational Innovation grant scheme the development of a small number of modules for the proposed Open Learning Environment including modules providing enrichment opportunities for the broader skills of the Sydney graduate
- creates a mechanism for coordinating and supporting education-focused industry and community engagement
- makes the Summer and Winter teaching periods available in all degree programs and encourages the development for offer in Summer or Winter of a range of experiential learning opportunities suited to an intensive format
- increases opportunities and support for intensive and semester-long mobility and fieldwork experiences.

### 4.2 Enabling and recognising teaching excellence

To achieve our aspirations for the educational experience the University of Sydney offers and the educational outcomes it delivers, we need an outstanding professional learning and support environment for learning and teaching. The Education portfolio is establishing a new ‘hub and spoke’ operating model and a refreshed professional learning environment intended to be responsive to faculty needs and supportive of strategic innovation and quality improvement across the University.

A new Excellence and Innovation group within the Education portfolio will offer integrated professional learning opportunities at a general, whole-of-university level as well as through carefully targeted division- and faculty-focused activities. The group will comprise teams with pedagogical and technological expertise who will build collaborative relationships with division and faculty staff, aiming to provide more sustained and strategically focussed professional support for educational excellence and innovation in each division and its faculties. The proposed arrangement seeks to accommodate the realities of academic work through flexible and timely engagement tailored to the temporal patterns of the academic cycle.

It will be important to ensure that a commitment to educational excellence permeates our processes for the recruitment, confirmation, performance, development, promotion and recognition of academic staff. Though significant efforts have been made in recent years to ensure appropriate attention is given to teaching, research and service, a review of all these systems is warranted as we seek to lift our aspirations for educational as well as research excellence. As part of this process, and in recognition of the limitations of existing indicators of teaching excellence, we should consider how to incorporate the judgment of peers in the evaluation of teaching. To emphasise the interdependence of our research and education missions, it is also proposed below that a single set of awards recognises excellence across the diverse forms of academic and professional staff work.
We should also ensure that all staff have access to effective and appropriate professional learning opportunities. At present, the confirmation process for new staff involves completion of the *Principles and Practice of University Teaching and Learning* program, comprising a two-day course and various faculty-based activities. It is timely to review the program and its effectiveness as part of a broader refresh of the professional learning framework for learning and teaching. For example, mentoring programs devoted to the development of academic staff as researchers and teachers, and more systematic programs for supporting peer review of teaching should be considered.

Finally, we must attend to the professional learning needs of sessional and casual teaching staff. Sessional staff members make a significant contribution to the University’s educational programs, yet their sessional status means that they are not always included in professional learning opportunities intended to promote educational excellence. It will be important, therefore, to build on the opportunities recently developed for sessional staff (see Box 11), including those who are also Higher Degree by Research students.

Some faculties have induction programs for sessional staff; but we need to do more, and to do it systematically and in ways informed by feedback on its effectiveness, if we are to ensure effective professional learning for all staff. Options to be considered include:

- ensuring that sessional staff have access to timely and appropriate professional learning opportunities prior to engagement in teaching
- ensuring that sessional staff have access to effective systems of feedback on teaching, including from students and unit of study coordinators
- requiring sessional staff to have documented successful teaching experiences or to have successfully completed professional learning experiences (at the University of Sydney or elsewhere) prior to being engaged as sessional teaching staff at the University.

As part of its ongoing activities, therefore, the University should:

- consolidate the new hub-and-spoke model for professional learning and support for learning and teaching
- review appointment, confirmation, performance and development, and promotion processes to ensure an effective focus on teaching as part of a suite of criteria for academic excellence, and
- develop more systematic means for incorporating the judgment of peers in the evaluation of teaching.

This leads us to the second proposal:

**Proposition 2**

That the University:

- refreshes the professional learning framework for learning and teaching to optimise the use and effectiveness of professional learning opportunities;
- reviews all of the University’s schemes for recognition of excellence and develops a single suite of awards for outstanding performance in all aspects of academic and professional staff work.

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**Box 10. Professional learning for sessional teaching staff.**

Dr Amani Bell, Institute for Teaching and Learning, has led development of an online program for casual academics with teaching roles. The program at http://www.itl.usyd.edu.au/introduction-to-teaching/about/ draws on higher education research, the principles of good teaching and practical suggestions from experienced teachers at the University of Sydney.
4.3 Evidence for learning and teaching: assessment, feedback, analytics

Assessment is a vital part of university teaching, yet it draws frequent criticism. Students are often critical of its timing and volume, and find it inadequate as a means of obtaining feedback to improve learning. Staff find assessment time-consuming, particularly for large classes, and often feel constrained by pressures of workload or timing to set assessment tasks that are less authentic than they would like.

External pressures on assessment have also emerged. The proposed Higher Education Standards now demand alignment of assessment and learning outcomes and demonstration of the achievement of course-level learning outcomes by students. More recently, the integrity of assessment has also been a matter of both public and internal University concern and has led to the creation of the Vice-Chancellor's Academic Misconduct and Plagiarism Taskforce.

Despite these challenges, assessment is important for its formative function, providing feedback to students and staff on progress in learning, as well as its summative function, providing certified evidence of the level of learning attained by each student.

Assessment was the key focus of the 2014 Sydney Learning and Teaching Colloquium, at which expert advice as well as broad agreement among participants highlighted the need to:
- reduce the volume of summative assessment
- increase the use of effective low-stakes formative assessment
- increase access to optional no-stakes formative assessment
- increase use of more authentic assessments, and
- consider mechanisms for enabling integrated assessment across multiple units of study.

From the perspective of students, well-designed and targeted formative feedback and assessment provide the information they need and want in order to monitor and adapt their own learning behaviour. As John Hattie has cogently argued, these forms of feedback are also important for staff, furnishing the information teaching staff need to adapt the design of learning situations to students’ learning needs; this often includes raising the aspirations for student learning.

Some contemporary learning environments can automate formative feedback and adaptive learning experiences, delivering valuable feedback to students and staff while avoiding unmanageable assessment workloads. Sometimes, also, assessment tasks can be designed to serve both formative and summative roles. For example, the assessment for a unit of study might include a short sequence of related assessment tasks, with feedback on earlier tasks informing the completion of later ones. This cycle of assessment and review is also characteristic of many project reports and theses, and it is often useful for the final submission to contain a section that is fully summative and has not had the benefit of earlier review.

It will be particularly important for academic staff to develop expertise in the assessment of major projects, including – as noted earlier – those that are interdisciplinary in character. These more authentic, integrative assessments offer excellent opportunities for evaluating course-level learning outcomes. They can also offer high levels of integrity because of the unique nature of the problem being addressed and the sustained and iterative nature of the student work required. For ‘capstone’ projects that require the integration of knowledge and skills acquired across the course of a degree, there will be value in developing a common rubric that can be used to assess University-level graduate qualities. Ideally, such a rubric would be used by students for self-assessment as well; and over time it would enable the calibration of students’ perceptions of their own progress with the views of their teachers and other external assessors.


Of course, assessment is not the only means by which students gain feedback on learning, and many staff design learning experiences that are rich in cycles of active engagement and feedback, for example through the use of discussion-, enquiry-, and practice-based learning designs. In large classes, for example, the use of audience-response systems can facilitate immediate feedback to teaching staff as well as to each individual student on students’ conceptual understanding and hence inform decisions by the teacher about the next learning experience likely to have most impact for the class. In other words, while assessment and feedback to students are obviously closely linked, it is valuable to consider both as part of a broader system of feedback on the learning process. Students consistently indicate their desire for more feedback and more ‘practice’ at applying new concepts, knowledge and skills; learning will almost certainly be improved where we can provide these things.

Learning analytics offers considerable promise as a component of a broader feedback system. As noted earlier, learning analytics involves the analysis of data held on University systems to characterise patterns of student engagement and learning and hence understand the potential impact and effectiveness of learning experiences on those patterns. Effective use of analytics can provide feedback to teaching staff on gaps in engagement, understanding and skill, and hence drive adjustments in educational approach that yield learning benefits for students. Even so, the full potential of learning analytics is a lively field of current research, and it will be important for us to engage in research as we explore its uptake. Almost certainly, the most effective approaches will be those that provide timely and insightful information to staff on student engagement and learning, and these should therefore be prioritised.

Direct feedback from students on learning progress and barriers to learning can also be helpful, such as that obtained through staff-student liaison groups or student groups comprising elected class representatives. If informal feedback is sought early from students, there is time to intervene and ensure they are able to benefit more effectively from the learning experiences to follow. Where such mechanisms are in place, students are also reassured of staff interest in their learning. Importantly, there is strong evidence that students are excellent predictors of their future performance (Hattie, 2009), so any concerns on their part about their learning progress deserve close attention.

The more information we have on the status of student learning, the better informed we should be for the process of iterative redesign required for continuous improvement and innovation in teaching. Using the different sources of feedback in combination should create richer information than any single source of feedback on its own. For example, it is very likely that having effective diagnostic formative feedback mechanisms in place will enhance the value of learning analytics because it will ensure the presence in the data stream of well-understood diagnostic anchors that can assist interpretation.

Further, by building and utilising broader systems of feedback to inform the design of learning experiences, we will be well-placed to engage with the broader evidence base on learning and teaching in higher education, both as critical consumers and data-rich contributors.

Box 11. Resources for first year chemistry.
The first year Chemistry program (Director of First Year Studies, Professor Adam Bridgeman) has developed a set of tutorials and self-assessment quizzes on key aspects of first year chemistry. The resources can be found at https://scilearn.sydney.edu.au/fychemistry/iChem/.

Box 12. Putting learning analytics into practice.
Dr Abelardo Pardo of the School of Information Technologies is undertaking a project supported by an Education Innovation grant to develop and test the effectiveness of identifying activity patterns involving interactive videos and automatic formative feedback via multiple choice questions, and implementing detailed reporting of these patterns to tutors and students. The work is designed to provide useful feedback to students and tutors on patterns of student engagement with learning resources.
To sum up, there are two valuable steps we should take to improve our system of feedback and assessment of learning. The first is to improve the effectiveness for both staff and students of the broader system of feedback on learning, including making greater use of diagnostic formative assessment. The second is to move to a leaner summative assessment regime, carefully targeted to high-integrity assessment of unit of study and course-level learning outcomes. Through these two steps, we can provide students with forms of feedback that improve their learning, and we can deepen our understanding of the contribution that individual learning experiences make to learning outcomes. As a result, we will be able to improve future learning designs, while certifying with integrity the levels of student achievement.

The following initiatives should be part of a process of continual improvement of our assessment and feedback system:

- provide targeted professional development and support for: the design and implementation of more diagnostic formative feedback opportunities for students, including for use in adaptive learning contexts; the use of multi-stage assessment and review cycles; authentic high-integrity assessment approaches; and
- as part of the curriculum redevelopment process, develop assessment plans at the level of course components (minors, majors, programs, and degree streams or specialisations) to ensure an effective constellation of authentic assessment experiences and broad coverage of relevant learning outcomes.

This gives us the third proposal for discussion:

**Proposition 3**

That the University:

- develops a University-wide rubric for assessment of graduate qualities
- explores the potential of learning analytics by implementing effective enterprise tools and facilitating research and innovation in learning analytics, and
- considers policy options for introducing high integrity, integrated assessments across units of study, and reviews policy for streamlining summative assessment at unit of study level.

**4.4 The learning and teaching environment**

To realise the University’s aspirations for educational excellence, the physical and virtual infrastructure for formal and informal learning will be vital. Over the period of the 2011–2015 Strategic Plan, Campus Infrastructure Services (CIS), ICT and Sydney eLearning have supported important programs of work aimed at improving infrastructure through transformational projects, annual refurbishment programs, and an expanded suite of enterprise learning systems.

An Educational Innovation grants scheme was established in 2014 to support innovation and quality improvement projects aligned with the educational goals of the 2011–2015 Strategic Plan. In addition, an Educational Technology Incubator (ETI) has been created in 2015 to bring together expertise from across the University to support educational innovation projects and evaluate them for potential university-wide adoption. This facility sits alongside ICT’s TechLab, which was established as a testbed for emerging educational technologies; see Box 13.

**Box 13. Supporting the assessment, development and uptake of educational technologies: the ICT TechLab and the Educational Technology Incubator.**

The ICT TechLab monitors emerging technologies and engages informally with faculties in initial development and trialling of new technologies within the University’s educational programs. The Educational Technology Incubator (ETI) is a new joint Education portfolio/ICT initiative that provides formal development support and evaluation of new technologies and educational initiatives, including several funded by Educational Innovation grants (see Box 14). Designed to sit between the Innovation Lab and the University’s enterprise learning systems, the ETI assists uptake at enterprise level of positively evaluated projects, supporting University-wide dissemination of promising technologies.

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32 For example, the University’s MOOCs are being developed as ETI projects.
Nonetheless, and as staff and student views summarised in Section 2 indicate, there are opportunities to improve the University’s learning and teaching environment and ensure that students reap the full benefit. As well as the physical and virtual resources that support formal classes and learning activities, that environment includes the social and intellectual milieu of the University’s talented and diverse community of staff and students.

Box 14. Educational Innovation grants.
The Small and Large Educational Innovation Grants are intended to support strategic faculty or cross-faculty initiatives that involve the creative application of existing approaches and technologies or the development of novel approaches and technologies to improve students’ learning experiences (see http://www.itl.usyd.edu.au/awards/educational_innovation_grants.htm). Applications are judged according to several factors: the scholarly rationale supporting the innovation; evidence of how the proposal will improve the quality and effectiveness of students’ learning experiences and the quality of learning outcomes; alignment with current strategic priorities; expected impact and reach; quality of evaluation plan; and sustainability of the innovation.

As noted earlier, staff are concerned about student engagement, particularly declining attendance and participation in lectures. For their part, students are concerned about the limited opportunities to interact with staff and with each other. Why don’t students simply turn up for class and enjoy the interactions that they and their teachers desire? The answer is potentially complex and, certainly, students refer to trade-offs involving part-time work, commuting long distances and difficulty in optimising their timetables.

Equally possible is that staff and students are seeking subtly different forms of interaction. Students indicate they want sustained and more individual opportunities to interact with teaching staff and with each other – forms of interaction that lead to more sustained engagement and a sense of social connection to the class; and they clearly do not find large lectures conducive to this. Fortunately, the educational approaches described above are just those to encourage interactions among students and teachers. As a result, a steady uptake of these approaches should yield increasingly strong learning-focused interaction and engagement, with social connection to the class and the University as a by-product together with all the learning benefits thereby entailed.

But how can we organise the learning environment – physically and virtually – to facilitate these interactions?

Physically, we can consider moving from a high level of reliance on constrained and teacher-dominated spaces such as the lecture theatre to greater use of spaces that facilitate a richer array of interactive forms, including small and large group discussion, mixing among groups, and informal interaction between a teacher and student. Such spaces tend to be flatter, more flexibly furnished, capable of reorganisation into different groupings, amenable to circular plenary discussion, supportive of staff and student mobility, and equipped to support diverse forms of access to resources, tools and technologies. We can also consider creating higher cost, better-equipped teaching spaces by finding the means to maximise the sharing and usability of teaching space, as we sought to do in creating the Charles Perkins Centre X-Lab. And as we make greater use of enquiry- and collaboration-based educational approaches, we will likely see increasing need for informal learning spaces that are ideally also equipped to support diverse forms of access to resources, tools and technologies. We should therefore consider developing more of these informal learning spaces that are close to scheduled class spaces and can support collaborative interactions outside scheduled class times. Ideally, too, these spaces should be close to cafes and other informal spaces, facilitating more social forms of engagement. All spaces should also be attractive to students and places where students want to be.

Of course, even minor change in the form of learning spaces requires careful planning, and we therefore also need the capacity to monitor the use and effectiveness of existing physical infrastructure and forecast the impact of changing educational approaches.

Virtually, we can do more as well. Recent years have seen a revolution in mobile 24/7 access to a rich array of University-supported learning resources, tools and technologies. Campus networks are being upgraded continuously and also support access to an expanding collection of external internet-enabled resources and tools. These trends are only likely to intensify.
The University has moved to make more extensive use of learning management systems and to experiment with a range of educational technologies. Staff are using tools such as Kaltura, Piazza, Socrative, Echo 360 and Smart Sparrow to make more resources available to students and enrich learning interactions inside and outside class.

Management of these technologies at enterprise level is vital if we are to provide a contemporary, agile and integrated virtual learning environment. We therefore propose the adoption of a single centrally supported suite of enterprise-level educational technologies.

Students also value access to these technologies in an integrated form. We should consider doing more to support the forms of interaction that students seek and that encourage engagement and learning. For example, we should provide more seamless and systematic access to the suite of enterprise-level resources and technologies, and ensure effective support for staff in the design and creation of interactive learning experiences that rely on these technologies, including those that promote interaction inside and outside the classroom. We might even consider providing broader student as well as staff access to an experimental suite of contemporary and emerging educational technology tools for exploration and evaluation.

We should also continue to support innovation and uptake of effective new technologies through a targeted funding program, and ensure effective appraisal and dissemination through the ETI (see, for example, Box 15).

Demand for the creation of short (5–6 minute) high-quality video resources is growing rapidly, particularly with increased use of more interactive educational designs; therefore additional capacity is warranted in this area. We should also consider building new capacity for animation, visualisation and simulation as means to deepen conceptual understanding.

To increase capacity, we should arguably move toward more dispersed expertise for higher-cost learning resource production, consolidating the new hub-and-spoke structure being developed for professional learning and support offered through the Education portfolio. These developments would support the further development of the University’s online courses and units of study, such as for the Diploma of Language Studies and the Master of Medicine.

More broadly, and in response to the wishes of students and staff outlined earlier, we should support the development of the ‘virtual classroom’ – one that facilitates extensive interaction within the class (for example, via text messaging, chat, online forums, videoconferencing) – from the point when students register in the course and the class, to when they complete. As part of this, we may wish to develop the means for supporting group and network structures that are created by design or that evolve organically.

We could also consider the suggestion from some students that we seek students’ agreement to make name and email contact details available to other class members, so they can seek each other out. And as noted earlier, we undoubtedly want to support all of this with a more functional LMS and, in some cases, with additional software.

The intention to build richer feedback systems and more targeted approaches to assessment and feedback will depend on improving supporting technologies, as will effective use of analytics. For example, Turnitin has proved to be a valuable tool for online submission and return of assessment, and its wider use could improve the assessment experience for students while helping to support academic integrity.

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**Box 15. Simulating fresh food supply chains.**

Dr Kim-Yen Phan-Thien and Dr Brian Jones, Faculty of Agriculture and Environment have been developing a business simulation game with support of a 2014 Educational Innovation grant. The interactive, competitive-based simulation software provides a platform for students to understand supply chain management with specific application in food and agribusiness, where supply chain dynamics and management decisions impact, and are influenced by, product characteristics such as postharvest physiology, perishability and storageability, nutritional and sensory qualities, functionality, and food safety.

Demand for the creation of short (5–6 minute) high-quality video resources is growing rapidly, particularly with increased use of more interactive educational designs; therefore additional capacity is warranted in this area. We should also consider building new capacity for animation, visualisation and simulation as means to deepen conceptual understanding.

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33 ICT Learning Media Production supports one-off production of short clips at no cost.

34 In Semester 2, 2015, for example, we are trialling software that supports students to create study groups in some large undergraduate classes.
In Developing a distinctive undergraduate education, an open learning environment is proposed, one that supports self-directed on-demand access to a pool of learning resources for all students, as well as access to workshop-supported modular courses on topics of likely interest to many students (for example, those that build broader skills for communication, analysis, data science, design).

The second research discussion paper likewise proposes an open learning environment for HDR students. These open learning environments will require technological support, ideally as part of the primary learning management system. They will also require a capacity to develop and produce high-quality resources. In this respect, the University’s engagement of Coursera to develop MOOCs that will run in both on-demand and session-based formats will help to build capacity for resource development as well as, in some cases, the resources themselves.  

More generally, adopting educational approaches that promote a socially engaged class and deeper learning will require access to a contemporary suite of enabling educational technologies and an environment supporting its maintenance and effective use.

In addition to including consideration of preferred educational approaches in the design of formal and informal learning spaces for students, and prioritising the upgrade of formal and informal learning spaces in 2016-20 campus planning and improvement initiatives, we make the following proposal:

**Proposition 4**

That the University:

- reviews the current collection of enterprise-level educational technologies with a view to developing and maintaining a single, integrated state-of-the-art suite (including a single learning management system) to support enquiry-based and collaborative learning designs, the development of high quality learning resources, the capacity for an interactive virtual extension of every University of Sydney class, and the Open Learning Environment, and

- ensures the ICT TechLab, the Educational Technology Incubator (ETI) and the enterprise suite of educational technologies provide a coordinated and effective system for technology assessment and uptake.

35 More broadly, we need to ensure effective utilisation of our new capacity for MOOC production and assess carefully and learn quickly from the initial suite of MOOCs already in production or scheduled for production over the coming year. MOOCs can serve a range of strategic functions that include: profiling of university expertise; public outreach and contribution to public good; educational leadership; student recruitment at bachelor, graduate coursework or research level; specialist knowledge dissemination designed to enhance the impact of the University’s research; educational collaboration; and the generation of revenue. Through its initial engagement with MOOCs, the University will be well-placed to prioritise its next steps in open online education.

36 It is proposed that resources in the Sydney Open Learning Environment be accessed in an online on-demand mode or a workshop-supported blended mode on a no-credit or small-credit (for example, two credit points, with additional assessment) basis, and that all satisfactorily completed modules be included on the academic transcript.
4.5 The co-curriculum, the broader student experience and student support

It is widely recognised that significant contributions to student learning come from experiences that sit outside the formal curriculum. These experiences include activities with explicit academic content (for example, engagement in competitions requiring disciplinary knowledge, not-for-credit research, service learning and workplace experiences) and those that are not explicitly academically aligned but nonetheless contribute to the development of the University’s proposed graduate qualities (such as engagement in artistic, political, religious and sporting activities and volunteering).

They encompass activities that provide academic support (for example, workshops designed to build foundational skills in communication and mathematics\(^{37}\)) as well as those that stretch students to develop advanced skills and knowledge\(^ {38}\). They also provide opportunities for contribution to society (for example, through volunteering or service learning), for deeper engagement in questions of values, purpose and ethics (such as through direct experience of communities and individuals facing difficult circumstances and political and religious engagement), and for the development of leadership skills (by taking on a team leader role in a competition, or participating in an entrepreneurship opportunity). In short, they support the development of skills useful in a wide variety of other settings, including communities, the workplace, and later life. A sample of activities is included in Box 19.

The logic of the curriculum framework proposed in Developing a distinctive undergraduate education is to bring some of these experiences into the curriculum, given the importance of their contribution to developing the proposed graduate qualities. This is especially true of the more experiential projects and competitions and service learning programs that challenge students on authentic problems, and demand a significant contribution from them. Where activities are embedded in the curriculum, there is a notional allocation of expected time commitment as well as an academic architecture to oversee and support academic staffing, associated educational activities and assessment.

Box 16. Co-curricular enrichment opportunities

A wide variety of co-curricular opportunities are available for students. Among them:

- The Learning Centre’s Academic Skills Workshop program. The Learning Centre offers a suite of co-curricular workshops for undergraduate and graduate students in academic skills, covering topics such as Foundations of Grammar, Critical Thinking, Essay Writing, Discussion Skills and Working in Groups, Writing a Critical Review, Professional Report Writing, Writing a Literature Review, Writing a Thesis Proposal. Their 2015 August-September program of 60 workshops already has over 1600 registrations, with a further 2600 waitlisted registrations.

- The Sydney Genesis Start Up Program is open to University of Sydney students and alumni and offers workshops, mentoring, networking, funding and prizes to support business, technology and social entrepreneurship.

- iGEM competition, an international and interdisciplinary competition in synthetic biology.

- Incubate, the University of Sydney Union’s Startup Incubation Program supports entrepreneurs to launch new startup ventures through a 14-week program.

Even so, it is valuable to encourage additional enrichment activities where possible, especially when they contribute to personal health and wellbeing, a lively and productive university community, and the University’s long-standing commitment to community service.

The University supports the broader student experience through the wealth of activities and support services provided through the Deputy Vice-Chancellor (Registrar) portfolio and student organisations. These include services that support students through the transition to University life, through the challenges that arise during their time at University, and as they transition to work or further study opportunities once they have completed their degree.

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\(^{37}\) For example, programs offered by the Learning Centre, the Mathematics Learning Centre, and the Writing Hub.

\(^{38}\) For example, the Incubate program, the Genesis, iGEM, analytics and Inter-Professional Learning competitions, the Triple A and SALSA programs, and a variety of research and other internship opportunities.
As the data summarised in Section 2.2 indicates, students at the University of Sydney are more critical of administrative arrangements and support services than students at many other universities. The Sydney Student project and the ongoing Student Administrative Services (SAS) project have been designed to deal with a number of these shortcomings, particularly on the administrative side, and should lead to significant improvement in students’ experience of the University.

In addition, the steps proposed in Developing a distinctive undergraduate education to simplify the structure of Sydney undergraduate degrees should address some of the difficulties students encounter in obtaining advice, given the highly specialised and distributed nature of knowledge concerning current degree requirements.

However, one area in need of particular attention is that of careers support, where University of Sydney lags the national average on percentage of satisfied students by 11-12%. The rising importance of University support for career transition was noted in Section 2.1, and the University clearly needs to improve in this domain. Stronger, broader and more coordinated engagement with external organisations through experiential learning collaborations is one way of supporting career transition, but we also require a more strategic and evidence-based whole-of-University approach to supporting the transition to work and an appropriate and coordinated mix of central and faculty-based assistance and activities. This will require investment, given the current low level of support for the central Careers Centre.

We therefore make the following proposal:

**Proposition 5**

That the University:

- invests effectively in careers support as part of an integrated framework of activities that develop, assess and demonstrate the Sydney graduate qualities and support graduate transition to employment or further study.
As is evident from the preceding section, the educational process is complex and so, necessarily, are efforts to achieve institution-wide excellence. Compounding the complexity is the interdependence of the steps towards educational excellence proposed in this paper and the process of curriculum redesign proposed in Developing a distinctive undergraduate education.

The question of how we can undertake these two programs of work simultaneously is therefore an important one, and once we have settled on the precise set of propositions to be carried forward, we will need a detailed implementation plan. While it is premature to attempt such a plan here, it is nonetheless helpful to sketch the kinds of steps that might be involved and the ways in which responsibility for them might be distributed. Importantly, we need to recognise that the changes proposed in the two education discussion papers are significant and would need to be managed, monitored and evaluated as major projects, with the resources necessary to carry them out effectively.

The University’s governance bodies – Senate, Senior Executive Group (SEG) and Academic Board – will all play their customary and distinctive roles in having broad oversight of the changes proposed in this and the earlier education discussion paper, including approval of proposed directions, resourcing, and any resulting changes to academic programs and policy.

Several working groups of SEG have begun preliminary discussions on next steps in response to the proposals put forward in Developing a distinctive undergraduate education and feedback on them from the University community. The central portfolios and professional service units (PSUs) will be responsible for specific aspects of the propositions put forward in the two papers, including:

- Professional learning and support (Education portfolio)
- Appointment, confirmation, performance and development, and promotion processes for academic staff (HR)
- Recognition of outstanding teaching achievement (Senior Executive team)
- Enabling technologies and capabilities for innovation, development, production, incubation and analytics (ICT, Education portfolio)
- Open learning environment (ICT, Education portfolio)
- Sydney Research Seminars (Research portfolio, Education portfolio)
- Formal and informal spaces for learning and teaching (Campus Infrastructure Services)
- Cultural competence (Indigenous Strategy and Services portfolio, Education portfolio, faculties)
- Industry and community engagement (Education portfolio, Indigenous Strategy and Services portfolio, External Relations, faculties)
- Enablers for mobility experiences (Registrar portfolio, Office of Global Engagement, faculties)
- Performance monitoring (Education portfolio, Planning and Information Office)
- Student services, including career support (Registrar portfolio, faculties)
- Student administration, including implementation of course changes (Registrar portfolio, faculties)
- Co-curriculum (Student services, faculties, Education portfolio, Student organisations)
- Alumni tracking (Vice-Principal (Advancement))
- Marketing and communications (VC portfolio)
- Recruitment (Registrar portfolio)

While as many as possible of the proposed changes can be taken up as business-as-usual improvements to the operations of portfolios, PSUs and faculties, others are likely to require project or ongoing funding for which specific approvals will need to be sought.
The academic governance bodies within faculties, schools, departments and disciplines will have a vital role in reviewing and, where necessary, revising the detailed curriculum design of degrees and degree components, including majors and streams.

This work will take on particular significance as we seek to achieve agreed changes to curriculum and course architectures while also embedding knowledge and skill development across units of study, aligning assessment to revised learning outcomes, and coordinating changes in educational approaches across units of study and degree components.

The role of leading and participating in these discussions within faculties, schools and departments will be critical, and we will need to recognise the additional work involved, especially for Associate Deans, coordinators of degrees, programs, streams and majors, and chairs of relevant academic committees.

We also need to ensure that we have effective forums for all aspects of the design process, including the discussions that will inevitably be necessary across school and faculty boundaries.

Much of the important work in curriculum redesign, educational innovation, quality improvement and coordination will be led by unit of study coordinators and involve colleagues who teach in or support their units of study. This means the effort is necessarily highly distributed, and it should therefore be carefully coordinated within and across units of study belonging to the same degree components or degrees.

In degrees offering significant choice, such as the Bachelor of Arts or Bachelor of Science, much of this work will be focussed at the level of degree components such as majors. In degrees with more fixed structures such as the Bachelor of Pharmacy, the focus can be at the whole-of-degree level.

While continuous improvement and curriculum redesign is part of the ongoing responsibility of each unit of study coordinator and each academic, support for the proposed level of curriculum and learning redesign will nonetheless be needed. This support will primarily be in the form of additional resources for administrative and project management support, relief of other academic responsibilities of key staff (including teaching, research, and administration), transition arrangements, or creation or acquisition of major learning resources.

It is envisaged that project funding will be established for this. Such funding could, for example, complement support provided by the new Excellence and Innovation team within the Education portfolio, and could be allocated by a Task Force (reporting to SEG) that would consider proposals for curriculum and learning redesign at the level of degrees and, in some cases, components common across a number of degrees.

This Task Force funding would be in addition to regular funding now made available through the Educational Innovation grants for strategic educational innovation and quality improvement initiatives. Making the funding available at the level of the degree will ensure strong coordination across degree components and their constituent units of study, and hence realise the ambition for excellence of the educational experience and educational outcomes.

Finally, it will be important to monitor progress in achieving intended outcomes as well as specific project milestones. The appropriate indicators of progress are the topic of the next section and are intended to complement the faculty-level Key Performance Indicators for Education that are now in place. It is important to recognise that change itself may impact some indicators, so we will need to monitor and respond quickly to any adverse changes.
6 Measuring excellence

As we embark on the task of achieving a step-change in educational excellence, it is worth reflecting on the indicators we should use to track and judge our progress.

These indicators should focus on the three identified aspects of educational excellence.

Educational experience. First, we should monitor students’ reports of their experience, and we should do so at many levels. At the level of course components (for example, units of study, majors, programs, degrees), informal feedback provides an immediate source of information to which short-term response can be made. At the institutional level, monitoring can occur through the suite of international, national and university surveys developed for current students and graduates, namely: the Unit of Study Survey (USS), the Student Experience Survey (SES)\textsuperscript{39}, the Student Barometer (SB), the International Student Barometer (ISB), the Sydney Research Experience Questionnaire (SREQ), the Postgraduate Research Experience Questionnaire (PREQ) and, for the moment, the Course Experience Questionnaire (CEQ). Where it is within our power, we should ensure that these surveys include items covering aspects of the experience we seek to prioritise, such as enquiry-based and collaborative approaches to learning, experiential learning, and intercultural and interdisciplinary learning opportunities.

Educational outcomes. Second, we should monitor educational outcomes, not just through the systematic assessments we undertake to ensure that students are achieving course learning outcomes, but also through the proposed assessment of graduate qualities. We should ensure that these assessments are themselves subject to peer feedback and benchmarking.\textsuperscript{40} We should monitor student retention and progression and students' success in accessing further study pathways and employment outcomes, including through the Graduate Destination Survey (GDS) and its proposed replacement, the Graduate Outcomes Survey (GOS). We should also make a significant effort to track graduates and their longer term career outcomes. An initiative of this type would provide valuable information concerning the longer term impacts of our educational offerings, would allow us to identify and serve the ongoing educational needs of our graduates, and would allow us to maintain contact with our graduates as well as help graduates connect with each other.

Educational environment. Finally, we should monitor the educational environment we have established and the degree to which it meets the needs of staff and students in achieving their respective educational goals. We currently obtain some broad feedback from students on the quality of learning resources through the Student Experience Survey as well as through some targeted and ad hoc assessments at the university level of specific learning spaces. But we have no systematic mechanism for obtaining feedback from staff on the quality of the learning environment in which we ask them to work, including access to tools, technologies and resources, support for innovation and quality improvement, access to professional learning and support, and priorities for increasing educational impact. Arguably, there would be substantial benefit in putting such a mechanism in place, especially if it can be done in ways that provide fast and effective feedback that can attract a rapid response.

There could be immense value, as well, in ensuring that the University’s experts in higher education have a voice in determining the University’s educational approaches, and it has therefore been proposed to develop an Education Advisory Group charged with providing annual feedback and advice on Education portfolio and University-level performance and plans. This step should also help to ensure that openness and responsiveness to feedback are embedded at all levels of the University.

It is therefore proposed:

**Proposition 6**

That the University:

- establishes an effective alumni tracking mechanism, one that will support Alumni and Development initiatives as well as an understanding of alumni career trajectories;

- develops a systematic means of obtaining timely feedback from staff on all aspects of the educational environment and opportunities for improvement.

\textsuperscript{39} This survey replaces the UES from 2015.

\textsuperscript{40} For example, through the Group of Eight Quality Verification System.
7 Conclusion

7.1 Our goals for educational excellence at the University of Sydney

The various initiatives just outlined are intended to realise the aspiration of excellence in educational experience, educational outcomes and educational environment. Collectively, they propose an approach to education that is more strongly committed to collaboration and partnership, innovation and experimentation, evidence and feedback, and openness and responsiveness.

This approach is consistent with the qualities proposed for Sydney researchers in the second research discussion paper, Building a culture of research excellence.

Ideally, this will also contribute to a deeper, cultural transformation of the University: through these initiatives we aim to reflect a new commitment to the University's educational mission and to communicate unequivocally the value placed on our staff's contribution to its realisation.

7.2 Your contribution

The purpose of this discussion paper is to elicit your responses to the ideas and proposals put forward. We encourage you to take the time to share your thoughts.

If you would like to respond to the propositions set out in this discussion paper, please do so by 18 September via the online form available through sydney.edu.au/strategy.

Should you require further time to submit feedback, please email us at university.strategy@sydney.edu.au
7.3 Summary of proposals for consideration

**Proposition 1**
That the University:
- promotes greater educational engagement with community and industry by bringing authentic contextualised disciplinary and multi-disciplinary problems into class learning activities
- creates a project funding stream for 2016-2019 to support curriculum renewal and redesign projects within the University’s programs, especially at undergraduate level
- supports the proposed Sydney Research Seminar as a research-intensive educational opportunity for staff and students
- supports through the Educational Innovation grant scheme the development of a small number of modules for the proposed Open Learning Environment including modules providing enrichment opportunities for the broader skills of the Sydney graduate
- creates a mechanism for coordinating and supporting education-focussed industry and community engagement;
- makes the Summer and Winter teaching periods available in all degree programs and encourages the development for offer in Summer or Winter of a range of experiential learning opportunities suited to an intensive format
- increases opportunities and support for intensive and semester-long mobility and fieldwork experiences.

**Proposition 2**
That the University:
- refreshes the professional learning framework for learning and teaching to optimise the use and effectiveness of professional learning opportunities
- reviews all of the University schemes for recognition of excellence and develops a single suite of awards for outstanding performance in all aspects of academic and professional staff work.

**Proposition 3**
That the University:
- develops a University-wide rubric for assessment of graduate qualities
- explores the potential of learning analytics by implementing effective enterprise tools and facilitating research and innovation in learning analytics, and
- considers policy options for introducing high integrity, integrated assessments across units of study, and reviews policy for streamlining summative assessment at unit of study level.

**Proposition 4**
That the University:
- reviews the current collection of enterprise-level educational technologies with a view to developing and maintaining a single, integrated state-of-the-art suite (including a single learning management system) to support enquiry-based and collaborative learning designs, the development of high quality learning resources, the capacity for an interactive virtual extension of every University of Sydney class, and the Open Learning Environment 41, and
- ensures that the ICT TechLab, the Educational Technology Incubator (ETI) and the enterprise suite of educational technologies provide a coordinated and effective system for technology assessment and uptake.

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41 It is proposed that resources in the Sydney Open Learning Environment be accessed in an online on-demand mode or a workshop-supported blended mode on a no-credit or small-credit (for example, two credit points, with additional assessment) basis, and that all satisfactorily completed modules be included on the academic transcript.
Proposition 5

That the University:
- invests effectively in careers support as part of an integrated framework of activities that develop, assess and demonstrate the Sydney graduate qualities and support graduate transition to employment or further study.

Proposition 6

That the University:
- establishes an effective alumni tracking mechanism, one that will support Alumni and Development initiatives as well as an understanding of alumni career trajectories
- develops a systematic means of obtaining timely feedback from staff on all aspects of the educational environment and opportunities for improvement.

7.4 What happens next?

This is one of a series of discussion papers scheduled for release between June and September 2015.

In addition to seeking your response, other processes to inform decision-making are also underway. Detailed work will be undertaken to better understand the benefits, opportunities, resource requirements and risks associated with each of the propositions set out here.

Together, the discussion papers in this series and the discussion they generate will form the foundation of our strategy for the next five years.
Appendix

Tables A1 to A5 provide a detailed breakdown of scores for the item-level responses under each broad focus area used in the 2014 University Experience Survey. Results for the University of Sydney are shown in comparison to the average for all Australian universities.

Table A1. Skills Development items (UES 2014)

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed critical and analytical thinking</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Developed ability to solve complex problems</td>
<td>59</td>
<td>61</td>
</tr>
<tr>
<td>Developed ability to work effectively with others</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td>Developed confidence to learn independently</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Developed written communication skills</td>
<td>59</td>
<td>63</td>
</tr>
<tr>
<td>Developed spoken communication skills</td>
<td>53</td>
<td>54</td>
</tr>
<tr>
<td>Developed knowledge of field studying</td>
<td>78</td>
<td>79</td>
</tr>
<tr>
<td>Developed work-related knowledge and skills</td>
<td>59</td>
<td>63</td>
</tr>
</tbody>
</table>

Source: Social Research Centre

Table A2. Learner Engagement items (UES 2014)

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felt prepared for your study</td>
<td>61</td>
<td>66</td>
</tr>
<tr>
<td>Had a sense of belonging to your university</td>
<td>50</td>
<td>53</td>
</tr>
<tr>
<td>Participated in discussions online or face-to-face</td>
<td>58</td>
<td>59</td>
</tr>
<tr>
<td>Interacted with students outside study requirements</td>
<td>53</td>
<td>46</td>
</tr>
<tr>
<td>Interacted with students who are very different from you</td>
<td>56</td>
<td>55</td>
</tr>
<tr>
<td>Been given opportunities to interact with local students</td>
<td>65</td>
<td>58</td>
</tr>
</tbody>
</table>

Source: Social Research Centre

Table A3. Teaching Quality items (UES 2014)

<table>
<thead>
<tr>
<th>Measure</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study well-structured and focused</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>Study relevant to education as a whole</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Teachers engaged you actively in learning</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>Teachers demonstrated concern for student learning</td>
<td>58</td>
<td>60</td>
</tr>
<tr>
<td>Teachers provided clear explanations on coursework and assessment</td>
<td>63</td>
<td>65</td>
</tr>
<tr>
<td>Teachers stimulated you intellectually</td>
<td>70</td>
<td>69</td>
</tr>
<tr>
<td>Teachers commented on your work in ways that helped you to learn</td>
<td>47</td>
<td>52</td>
</tr>
<tr>
<td>Teachers seemed helpful and approachable</td>
<td>69</td>
<td>72</td>
</tr>
<tr>
<td>Teachers set assessment task that challenged you to learn</td>
<td>74</td>
<td>77</td>
</tr>
<tr>
<td>Quality of teaching</td>
<td>78</td>
<td>81</td>
</tr>
<tr>
<td>Quality of entire educational experience</td>
<td>78</td>
<td>81</td>
</tr>
</tbody>
</table>

Source: Social Research Centre
### Table A4. Student support items (UES 2014)

<table>
<thead>
<tr>
<th>Student Support Items</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced efficient enrolment and admissions processes</td>
<td>65</td>
<td>72</td>
</tr>
<tr>
<td>Induction/orientation activities relevant and helpful</td>
<td>49</td>
<td>56</td>
</tr>
<tr>
<td>Received support from university to settle into study</td>
<td>47</td>
<td>58</td>
</tr>
<tr>
<td>Administrative staff or systems: available</td>
<td>56</td>
<td>65</td>
</tr>
<tr>
<td>Administrative staff or systems: helpful</td>
<td>52</td>
<td>60</td>
</tr>
<tr>
<td>Careers advisors: available</td>
<td>36</td>
<td>47</td>
</tr>
<tr>
<td>Careers advisors: helpful</td>
<td>35</td>
<td>47</td>
</tr>
<tr>
<td>Academic or learning advisors: available</td>
<td>57</td>
<td>62</td>
</tr>
<tr>
<td>Academic or learning advisors: helpful</td>
<td>61</td>
<td>65</td>
</tr>
<tr>
<td>Support services: available</td>
<td>48</td>
<td>55</td>
</tr>
<tr>
<td>Support services: helpful</td>
<td>48</td>
<td>56</td>
</tr>
<tr>
<td>Offered support relevant to circumstances</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>Received appropriate English language skill support</td>
<td>26</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning

### Table A5. Learning resources items (UES 2014)

<table>
<thead>
<tr>
<th>Learning Resources Items</th>
<th>University of Sydney</th>
<th>National average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of teaching spaces</td>
<td>78</td>
<td>86</td>
</tr>
<tr>
<td>Quality of student spaces and common areas</td>
<td>73</td>
<td>78</td>
</tr>
<tr>
<td>Quality of online learning materials</td>
<td>83</td>
<td>86</td>
</tr>
<tr>
<td>Quality of computing/IT resources</td>
<td>80</td>
<td>83</td>
</tr>
<tr>
<td>Quality of assigned books, notes and resources</td>
<td>77</td>
<td>80</td>
</tr>
<tr>
<td>Quality of laboratory or studio equipment</td>
<td>82</td>
<td>84</td>
</tr>
<tr>
<td>Quality of library resources and facilities</td>
<td>86</td>
<td>88</td>
</tr>
</tbody>
</table>

Source: Institute for Teaching and Learning
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