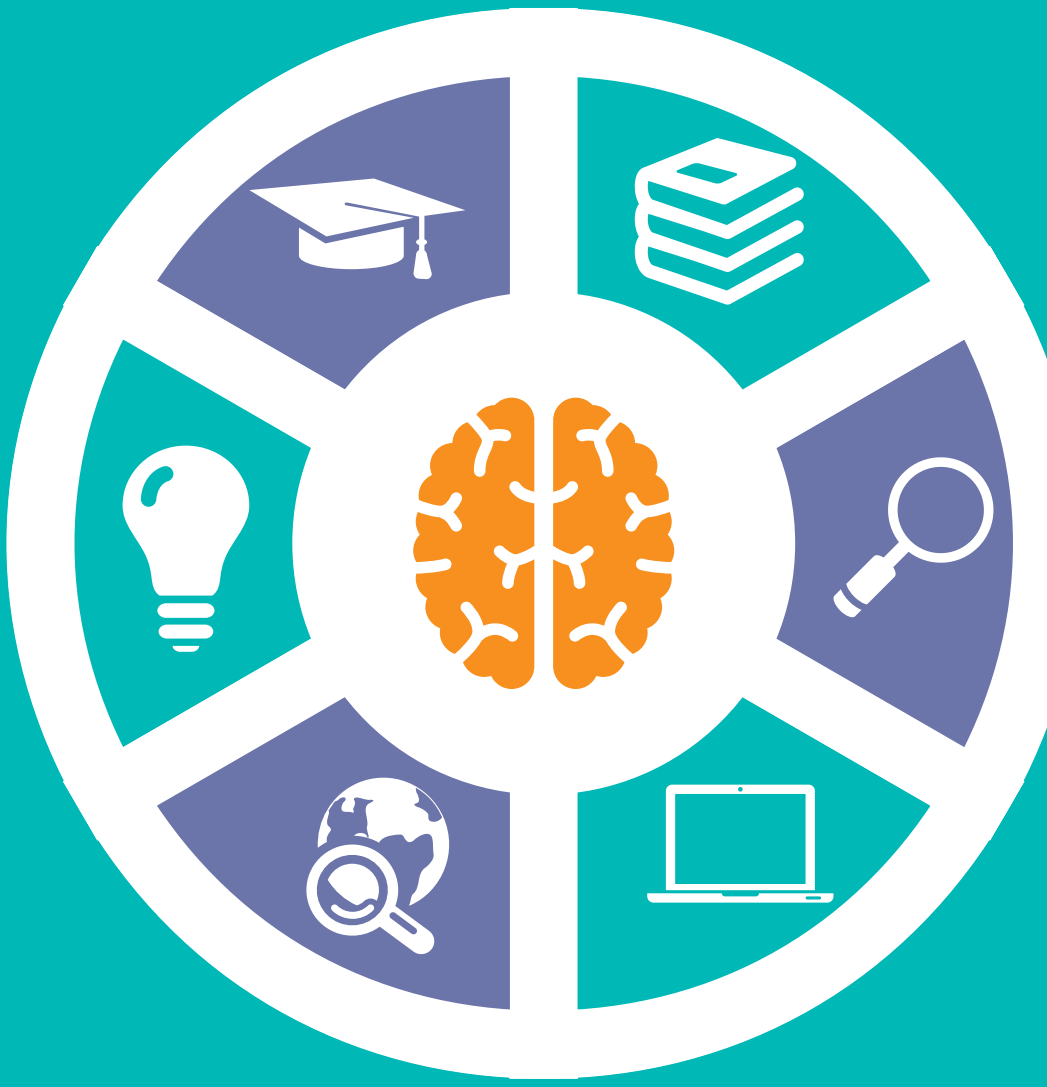
AUSTRALIAN HIGHER EDUCATION WORKFORCE OF THE FUTURE

JANUARY 2016



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AHEIA

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INTRODUCTION

Universities are generally considered to be significant contributors to social good through their ability to: create and disseminate new knowledge; influence social mobility, individual earning potential and quality of life; and contribute to and engage with society. Their economic viability has, to date, been proven by their sustainability and growth, even in the context of changing external factors such as policy, funding, technology and expectations of students and employers.

The internal and external demands placed on Australian universities have changed markedly over the past decade.[1] In particular, drivers such as changes in funding models and advances in technology have affected the way universities think about productivity, the scale at which they now operate, and how they deliver services and drive knowledge creation, translation and innovation.

Looking forward, over the next 10 to 15 years, the research we have conducted and the view from stakeholders across the sector indicates that the rate and impact of change in the sector will likely increase, and the type of change is expected to become increasingly uncertain and diverse. Many senior university leaders and thought leaders in the sector hold the view that Australian universities will need to reconsider their traditional business models. Themes such as the role of technology as a disruptor and source of innovation, the potential impact of fee deregulation, and increased competition from the private sector resonate with universities. At the same time, the role of the voice of the student continues to rise, the nature of work generally is evolving and voices are increasingly calling for opportunities to collaborate and influence teaching, research and innovation agendas (most recently highlighted by Prime Minister Malcolm Turnbull's National Innovation and Science Agenda).

There are many opinions in the public debate regarding fee deregulation (including politicians, university leaders, unions and students), the implications of broad government policy reform on universities, and how universities fund and deliver teaching, learning and research, yet there are relatively few declarations on the topic of resulting workforce implications. We believe there is an opportunity to explore and articulate the characteristics of the workforce of the future for Australian universities, and how universities might future-proof the way in which their staff workforces are structured, engaged and developed.

The extent to which future university workforces need to be fundamentally different to today will depend to some degree on the strategic choices each university makes in response to the external factors driving change in the sector. We believe that this means the workforce reforms each university makes will be differentiated by institution, in line with the strategic approaches that underpin increased diversity in the Australian sector.

The significant role of the workforce in this knowledge industry is critical to the continued competitiveness of the Australian higher education sector. Questions emerge about what the academic of the future needs to look like in order to deliver on changing expectations from students and industry on education experience, research and outcomes. One Vice Chancellor posed the question "Is the traditional idea of an academic career the wrong idea?"

[1] Number of reports including: Economist Intelligence Unit. The future of higher education: How technology will shape learning. The Economist (2008), Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012), Grattan Institute, Mapping Australian higher education, 2014, amongst others.

We believe there is an opportunity to explore and articulate the characteristics of the workforce of the future for Australian universities, and how universities might future-proof the way in which their staff workforces are structured, engaged and developed.

Building on previous research on the drivers of change in the sector, we have undertaken a quantitative and qualitative review that explored the impact of internal and external factors that are considered most likely to effect change in the sector, and the implications for operating models and university workforces. This document outlines the quantitative and qualitative evidence base, delving into the five key themes we consider to be the most significant drivers of change in the sector: technology, competition, funding and policy, student expectations, and employer expectations.

This report describes options of what universities can do to shape their future workforce by implementing reforms to the dimensions of workforce capability, engagement and structure. It also presents a set of detailed options for workforce transformation and a roadmap to articulate the way in which change may be introduced into the sector.

The intent is that the research and findings of this report will be publicly available, to support and influence a national discussion about the criticality of establishing and maintaining a future-ready workforce in the university sector. Our aspiration is that this document will be used by universities to guide their future strategic workforce planning and development.

METHOD OF RESEARCH

The Australian Higher Education Industrial Association (AHEIA) engaged PwC to conduct a study into the Workforce of the Future in the higher education sector. The study was initiated in October 2015 with a blend of qualitative and quantitative research methods to surface insight. The workforce options have been developed on the foundation of solid research and analysis and centred on the user of the solutions – universities.

To inform the study, two key questions were identified by AHEIA to guide the research and analysis. These were:

1. Which drivers of change will have the greatest impact on the Higher Education sector in the next 10-15 years?
2. What does this mean for how universities will need to structure their workforces in the future?

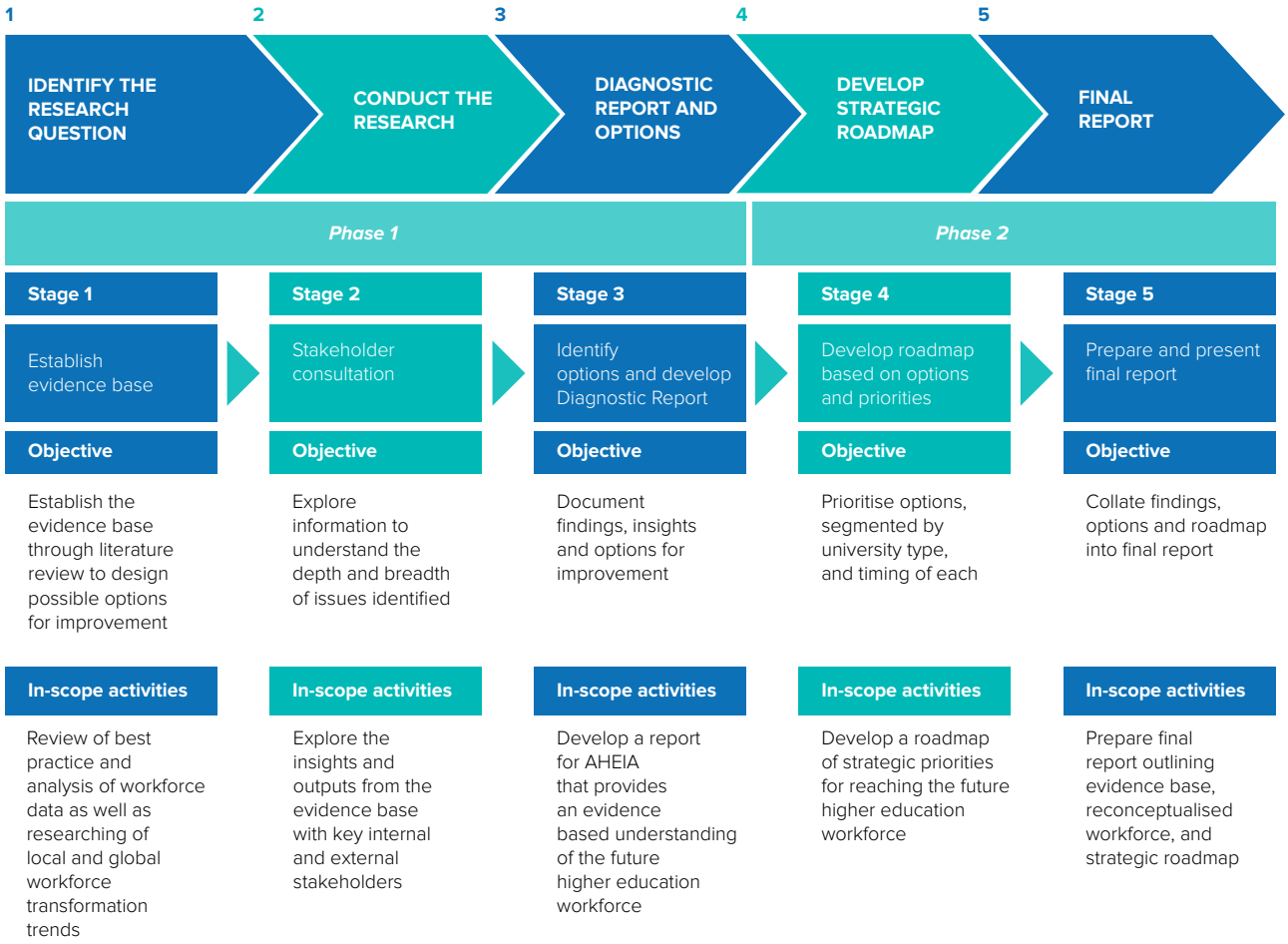
The study involved a five-stage approach, with Figure 1 providing an overview.

AHEIA also identified a number of key themes for consideration when conducting the research:

- **Environmental impact factors**
  Slower growth in the domestic market, rapid and ongoing growth in the international market, and ongoing changes to the regulatory and funding environments.
- **The changing nature of work**
  How organisations can better meet mobility, flexibility, and career driven demands of the modern workplace.
- **Changing business models**
  Opportunity to adapt the way universities operate based on changing future needs.
- **Student expectations**
  The Demand Driven System is placing demands on universities to deliver in line with increasing student expectations.
- **Future workforce needs**
  The nature, capability requirements, and roles and responsibilities of the higher education workforce will need to change.

These themes were used in developing the hypotheses for investigation during this study.

Figure 1: Summary of overall approach



RESEARCH AND ENGAGEMENT METHODOLOGY

Our research methodology consisted of three key activities:

1. A desktop, qualitative review of relevant literature, including:
   a. Best practice examples and critical success factors in the higher education sector locally and globally;
   b. Alternative models of workforce structure and management;
   c. Student expectations; and
   d. Examples of private sector best practice (where applicable in a higher education setting).
2. A desktop, quantitative research and analytics review, including:
   a. Surveys and other data including Department of Education uCube, Graduate Destination Survey (GDS) and Course Experience Questionnaire (CEQ) Student Surveys, Australian Bureau of Statistics, Universities Australia (UA) Higher Education and Research Facts and Figures and Grattan Institute reporting.
   b. Distribution and analysis of a Higher Education Workforce of the Future Survey to a range of university leaders, including Vice Chancellors, Deputy Vice Chancellors, and Human Resource Directors in all universities in Australia, as well as senior managers (e.g. Heads of Schools, Deans) in 15 selected universities, for a total of 215 respondents.
3. Engagement with the sector and public through interviews, teleconferences, workshops, online submissions and the media, including:
   a. Ten discovery workshops and 16 interviews with university leaders, including Vice Chancellors, Deputy Vice Chancellors and HR Directors. These were facilitated via face-to-face meetings, phone calls, group workshops and group teleconferences.
   b. Ten interviews with higher education Subject Matter Experts (SMEs), including prominent academics from the Grattan Institute and the LH Martin Institute, staff and student unions (specifically the National Tertiary Education Union (NTEU) and Council of Australian Postgraduate Associations, (CAPA)), business groups (including the Business Council of Australia and the Australian Industry Group). We also invited the National Union of Students and the Australian Services Union to participate but were unable to secure participation by the date of this report.
   c. Five interviews with Vice Chancellors, Senior Administrators, and former Vice Chancellors in universities in the United States of America (USA), United Kingdom (UK) and Canada.[2]
   d. A workshop with students, and we drew upon prior research conducted by PwC on student expectations in higher education.
   e. Submissions from interested members of the public and broad sector, facilitated through the AHEIA website (http://www.aheia.com.au) and publicised in The Australian Higher Education Supplement. In addition, articles referring to the study were published in The Australian and Campus Morning Mail in November 2015.

In total, approximately 340 stakeholders from across the sector were engaged (through differing methods) throughout all stages of the research.

The complete group of stakeholders is outlined in Table 1.

The stakeholder interviews and workshops provided the opportunity to test and explore research areas identified through the review of the evidence base. The valuable feedback provided by stakeholders was documented and categorised into themes to allow for the formulation and stratification of the options for implementation.

Throughout the course of the engagement there were regular presentations to AHEIA to inform progress as well as to discuss the emerging themes at key points of the engagement.

Table 1: Stakeholders consulted during engagement

University specific stakeholders	Broad sector stakeholders
• Vice Chancellors • Deputy Vice Chancellors Corporate, Academic, Research and International (DVCC, DVCA, DVCR, DVCI) • Human Resource Directors (HRDs) • HRD/DVC Delegates • Heads of Schools/Deans (in selected universities) • Students • Targeted international universities • Employee representative groups	• Sector thought leaders • Industry bodies • Ministerial representatives • PwC subject matter experts • Public submissions

[2] Contributions from Professors Edward Peck, Paul Curran, Daniel Julius, David Graham and Indira Samarasekera.

OBSERVATIONS ON THE CURRENT HIGHER EDUCATION SECTOR

With total revenue of over $26.5 billion in 2012, the higher education sector within Australia is significant. In 2014, education-related services (inclusive of student expenditure on tuition fees and living expenses) were the fourth largest Australian export, behind only Iron Ore, Coal and Natural Gas.[3]

Due to the future focused nature of this report and the extensive analysis provided by the Grattan Institute, the following information relating to the current state of the sector has been sourced from the Grattan report, unless otherwise stated.

Providers

While to many, traditional bricks and mortar universities are the mainstay of the higher education sector, the Grattan report found that in mid-2014 there were a total of 172 higher education providers operating in Australia, and only 40 of these were classified as universities. Universities, however, accounted for $25.4 billion (or 96%) of the total $26.5 billion in revenue in higher education services for 2012. The remainder of these providers are classified as non-university higher education providers (NUHEP) comprised of both private and publicly listed organisations, largely with a focus on teaching only and often providing specialist or vocationally focused courses.

Australian requirements dictate that in order to be classified as a university, organisations must meet set criteria as governed by Commonwealth Government Provider Category. The most restrictive of these regulations is the requirement to be active in research 'across at least three broad fields of study: disciplines such as health, engineering, education or science'.[4]

Given these regulations, new entrants as university providers in the higher education space are few and far between. Indeed, the Grattan report cited Torrens University Australia as the only new university to enter the Australian market since the 1990's. However, the total number of NUHEPS has increased from 78 institutions in 1999, to 129 in 2014. Student numbers at NUHEPS have also increased, with just under 15,000 students in 1999, to 54,000 in 2014.[5]

Students

Of the more than 1.3 million student enrolments in the sector in 2013, the report found that domestic students represent approximately 75%, with approximately 330,000 international enrolments. Approximately one - quarter of enrolments were for postgraduate coursework and research, with the remainder being undergraduate. The majority of students are enrolled on a full time basis, however a distinction can be drawn between levels of study, with 2013 figures showing that 77% of undergraduate students were engaged in full time study, compared to only 36% of postgraduate students.[6]

Although the long-term trend indicates a movement off-campus, around 80% of undergraduates currently study on campus – a level which has remained relatively consistent over the past five years.[7]

[3] Australian Government, Department of Foreign Affairs and Trade, *Australia's trade in goods and services 2013-14.* (http://dfat.gov.au/about-us/publications/trade-investment/australias-trade-in-goods-and-services/Documents/fy2013-14-goods-services-top-25-exports.pdf).
[4] Grattan Institute, Mapping Australian higher education, 2014.
[5] Department of Education, EFTSL data (2014).
[6] Grattan Institute, Mapping Australian higher education, 2014.
[7] GDS Student Survey 2010 through 2014 Results.

The Australian university workforce in numbers:

116,000
individuals employed by universities on a full time or fixed-term contract basis

67,000
individuals employed as casual academics

360%
in "teaching only" roles from 2001 to 2014

1:73 ratio
between fulltime equivalent teaching role and students

Workforce

Universities continue to be a significant employer, with 116,000 individuals employed by universities on a full time or fixed-term contract basis, with 2010 figures showing an estimated additional 67,000 individuals employed as casual academics.[8]

Evidence suggests that the profile of the university workforce is increasingly senior with positions at 'above senior lecturer' having grown by over 100% between 2001 and 2014. During this time role specialisation has also occurred, with the number of specialised teaching roles growing by 360% and specialised research roles by 96%.[9] 2014 figures show approximately one full time equivalent teaching role was in place for every 73 students.[10]

Funding and industry collaboration

Currently approximately one-third of public universities' revenue comes from students, up from 25% in 1997. However, through extensive use of the Higher Education Loan Program (HELP) among the student population, around 60 percent of this cash flow to universities can be attributed to the federal government in recent years.

Additionally, during 2014 the single largest source of public funds was the Commonwealth Grant Scheme (CGS), distributing a total of $6.4 billion to universities. As a percentage of GDP, the 2011 levels of total investment (both public and private) in tertiary education institutions in Australia represents 1.60%, below the OECD average of 1.63%.[11] Research grants to the value of nearly $3.5bn were provided to higher education providers in 2013. These were predominantly made up of competitive research grants (from the Australian Research Council and National Health and Medical Research Council), and performance-based block research grants (Research training and general research funding), at around $1.5bn each. The remainder is from other recurrent grants (including equity, national institutes and the Tertiary Education Quality Standards Agency).[12]

Australia's rate of collaboration between university research and industry sectors (at 2-3%) is the lowest in the OECD. The federal government is taking action to encourage Australia's world-class researchers and businesses to better collaborate to shape our future industries and generate wealth. The mechanisms for funding university research are being changed and simplified, with more focus on industry collaboration and less on publishing articles in academic journals. The six block grant schemes will be collapsed into two, with equal rating for research excellence and income from industry. The government will add $127 million in funding for university research over the next four years.[13]

The federal government is also seeking to invest approximately $9.7 billion in research and development in 2015-16. Around $3.2 billion will directly support business sector research and development (R&D), with much of the remainder funding research in universities and research agencies such as CSIRO.[14]

[8] Grattan Institute, Mapping Australian higher education, 2014.
[9] Department of Education U-Cube: Enrolment and Staff.
[10] Department of Education U-Cube: Enrolment and Staff.
[11] UA Higher Education and Research Facts and Figures Nov. 2015.
[12] Grattan Institute, Mapping Australian higher education, 2014.
[13] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report,* December 2015.
[14] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report,* December 2015.

EXTERNAL ENVIRONMENTAL DRIVERS

A number of macro trends are driving change in the higher education system within Australia and globally: the emergence and adoption of new technologies and the digital innovation economy; globalisation; the Asian century; economic and industrial restructuring; the need to improve productivity; and international collaboration.[15, 16]

The higher education sector is currently being challenged by: financial pressures, including from erosion of public finances; unprecedented competition and new challengers (including from the private sector for teaching and research, and from alternative business models); globalisation of competition for students, the workforce, and research funding; questions about the relevance and quality of higher education; changing demographics of student populations; and advances in information and communication technologies.[17, 18, 19]

While many factors emerged from our research, the five external environmental drivers that are the most significant and likely to effect change in the sector over the next 10-15 years are:

1. **Industry expectations**
   Industry will continue to increase its influence, both as an employer and a potential research and collaboration partner. Employers have an increasing expectation that graduates will be "work ready" and competent in skills including problem solving, critical thinking, emotional intelligence and digital literacy. This is particularly the case as organisations increasingly look to identify innovations in their own business models to remain competitive and relevant to their customers. University leaders see displacement of existing jobs by new jobs as the most significant change to the nature of future work, and industry interaction as the number one change to the business model universities will need to give consideration to.[20] Likewise, as the nature and funding of research changes over time, collaboration with industry in research endeavours presents an opportunity to both exploit new revenue streams and contribute to Australia's economic future, in line with the opportunities presented by the federal government's National Innovation and Science Agenda.

2. **Technology**
   A consistently cited theme was the impact of technological change in both the professional services and engagement of the university with students, as well as digitisation of curriculum design, delivery and research. This has already led to many changes, and the expectation by many in the technology and innovation field is that we are only just at the beginning of a knowledge/technology revolution. University leaders believe this to be one of the top three environmental factors impacting universities in the future, and the second highest feature of the changing nature of work.[20]

[15] Universities Australia (2013), *An agenda for Australian higher education 2013-2016,* February 2013.
[16] Coates, H., and Goedegebuure, L. The real academic revolution: Why we need to reconceptualise Australia's future academic workforce, and eight possible strategies for how to go about this. LH Martin Institute (2010).
[17] Coates, H., and Goedegebuure, L. The real academic revolution: Why we need to reconceptualise Australia's future academic workforce, and eight possible strategies for how to go about this. LH Martin Institute (2010).
[18] Presidential Innovation Lab. Beyond the inflection point – Reimagining business models for higher education. American Council on Education (2014).
[19] Zusman, A. Challenges facing higher education in the twenty-first century.
[20] PwC, Higher Education Workforce of the Future survey, 2015.

3. Competition

Australian universities will continue to face competition for increasingly scarce resources: domestic and international student enrolments, academic and professional talent and research talent and funding (although the latter was less frequently cited). In addition to traditional university competition, institutions will face competition from global universities with online presence, non-university higher education providers (NUHEPs) and other non-traditional private sector providers. Equally, there will be opportunities to apply for funding from new global sources such as the Bill and Melinda Gates Foundation. According to Australian university leaders, "increased global competition" is in the top four environmental factors most impacting universities in the next 10-15 years.[21]

4. Student expectations

Australian students today are increasingly expecting a more customer-focused and convenient offering. As more international, mature age, low socio-economic status and part-time students enter higher education, more diverse needs than ever need to be considered and catered for. However, employment prospects in the graduate labour market are the lowest they have been since the 1970s – "in 2014 only 68% of new bachelor degree graduates were working full-time four months after graduating".[22]

5. Policy and funding

Historical policy direction supporting "massification" and education access has been paired with slower funding growth compared to the cost of delivery. University leaders believe changes to requirements for how universities are funded and operate are likely to be an uncertain, and significant, driver of change in the sector: 42% of university leaders participating in the survey believed this would be the most significant driver. Research funding also continues to be a significant topic of debate, with government funding increasingly focused on translational and applied research.

[21] PwC, Higher Education Workforce of the Future survey, 2015.
[22] Grattan Institute, Graduate Careers Australia, 2014.

INTERDEPENDENCIES EXIST BETWEEN THE EXTERNAL DRIVERS

These factors will both effect change individually, and as part of a system of influence. As such, we should refrain from viewing the drivers or their impact on the sector, in isolation.

Technology, for example, interacts with a number of the other drivers: as an enabler or disruptor (or arguably, a driver) of changing student expectations for delivery and accessibility of teaching and learning in a university setting; as an enabler of stimulating competition within the sector by allowing potentially non-traditional competitors to deliver higher education services outside the constraints of the typical university model; and further, technology could also drive competition from non-locally based competitors whilst simultaneously allowing locally based institutions to extend their reach further.

Industry and student expectations could also be seen as interdependent – some university leaders we spoke to believed that because students have increased access to employability data, industry hiring practices influence students who are inclined to make university and degree decisions based on likelihood of securing full-time employment. For example, a shift in emphasis by employers from focussing on university grades to competencies is likely to result in a shift in the expectations of students on universities, in their desire to meet the demands of potential employers.

Subsequently, universities who strongly deliver on employer expectations may be more likely to be viewed favourably by external bodies, or industry, in the competition for funding.

Changes to funding may affect the expectations students have of universities' value for money, depending on the level of their personal contribution and expected debt burden upon graduation, and the relative importance of employability. Furthermore, were current funding models altered to place a larger focus on sourcing funding from non-government sources (e.g. industry), it could be foreseeable that the expectations of those organisations or industry bodies would be more influential, given their level of investment in the sector. Such a change in the funding landscape would fundamentally shift the relationship between universities and industry.

The federal government intends to make research funding available on the condition that research is undertaken via collaboration between industry and universities,[23] which presents further challenges (and opportunities) for how industry expectations will influence future university operations.

In considering any response to the external drivers of change, we believe universities will need to account for both the interaction between the each of the drivers, and also the downstream impacts of their response on other drivers, remembering that these factors in turn have the ability to affect how universities operate, and consequently place demands on their workforces.

[23] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report,* December 2015.

The need for differentiation across the sector

The research base uncovered a consistent theme that was common to the range of the external drivers, and we believe it has the potential to bifurcate, or create greater diversity in, the way in which universities respond to these changes.

There is an increasing sense of urgency regarding how universities answer the question "what are we producing?" and a shared view that a choice will be forced for both:

- what type of student is created from each Australian university: a competent learner, a work-ready future employee, or something in between; and
- the extent to which research is part of the university's differentiated value proposition.

A common view emerged that the environment and pre-conditions for Australian universities' decision-making has led to a high degree of homogeneity in offerings (while recognising that some universities are already seeking to differentiate themselves) that is unsustainable in a globally competitive sector over the long term. How universities respond to student and employer expectations, and how they allocate resources in a constrained environment (for example, working within the Australian Qualifications Framework or AQF), in particular – will be driven by answers to the question posed above.

Our research showed that universities that operate as fortresses, impermeable to external influences, are no longer sustainable – and in fact increased engagement with industry, community, and local and global peer institutions will be critical to survival. We believe that differentiation will be driven by universities' choices to open up to, and respond to, these external factors.

Attributes all university workforces will need to have

Our research also identified three future workforce attributes that we believe all university workforces will need to have, given the anticipated changes to the sector resulting from the external drivers identified in this section.

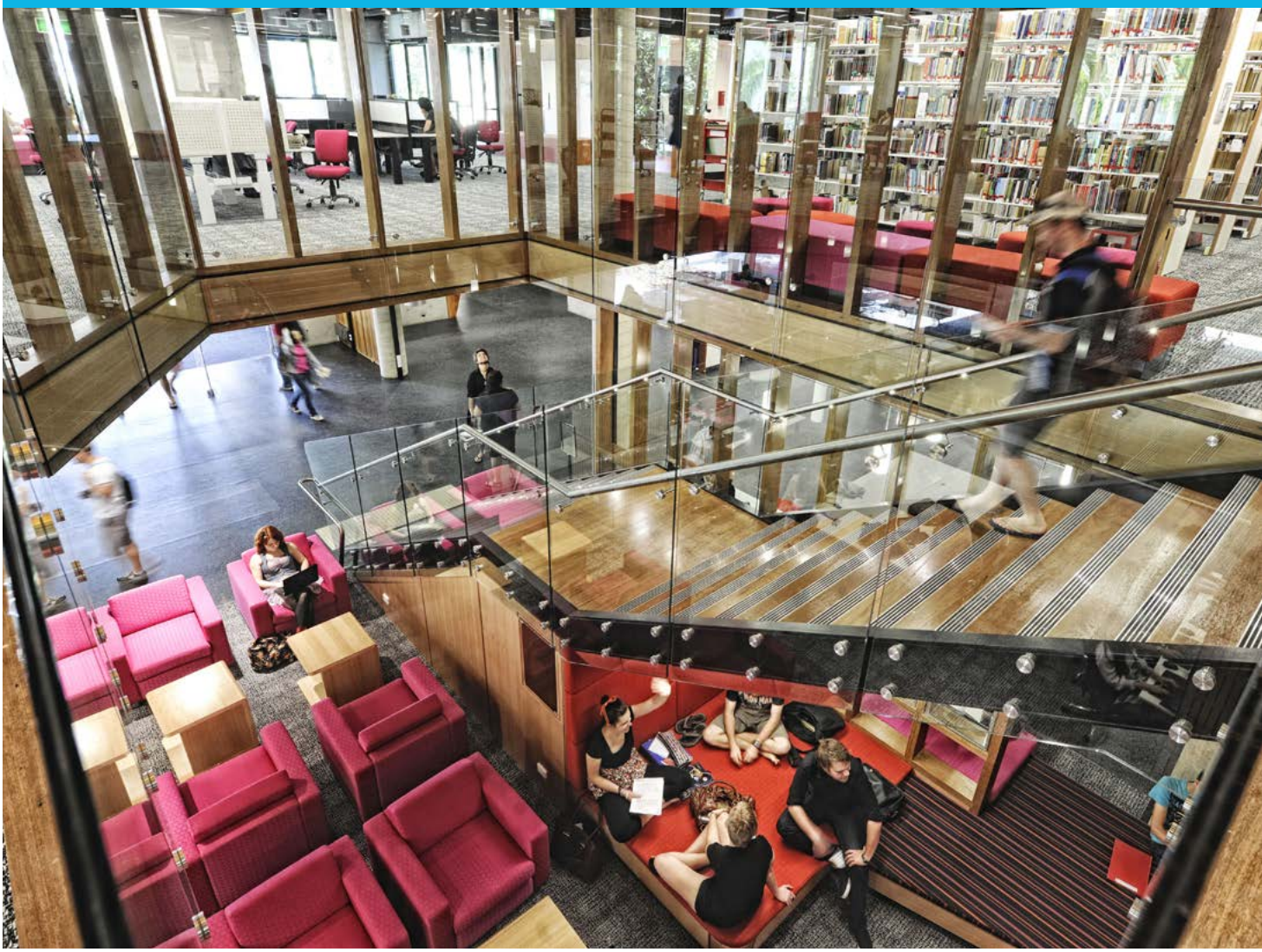
1. **Agility and flexibility**
   Future university workforces will need to exhibit agility and flexibility, both structurally and behaviourally, in response to a range of factors, including an uncertain funding and policy environment, increasing rate of change within the workforce and of the jobs needed in the Australian economy, and volatility in student expectations. Fifty-six percent of survey respondents believe that increased workforce agility is the most significant change required of the workforce (three quarters ranked it in the top three). More flexible workload models were also highly rated as a critical feature of future workforce design.[24] Universities will need to adopt increased flexibility in how the workforce is structured and managed across schools, to recognise different future requirements.
2. **Professionalisation**
   The increased and continuous professionalisation of both staff and leadership as a lever to ensure the sustained relevance of capability and skill set of the university workforce is critical. This encompasses both continuous development of skills to deliver in current roles (i.e. understanding the potential of digitisation for teaching and research), as well as the acquisition of new domain expertise. Where traditionally training was a relatively static exercise, the rate of change in the sector increasingly necessitates a development culture, by which knowledge and expertise is continuously reframed or built upon through adjacent disciplines – and by which technical and professional capacity is renewed. Universities able to adopt this method of building capability will be better positioned to also demonstrate agility and thus may realise competitive advantage through strengthened workforce capability.
3. **Specialisation**
   A number of factors, including the scale of universities and the scarcity of research funding, necessitate greater role specialisation – both for existing and emerging role types. The most frequently cited opportunity for specialisation, which has arguably been partly implemented to varying degrees across the sector, is the moving away from the 40/40/20 academic workload allocation model, and changing the "one size fits all" expectation regarding research participation. A corollary to this was increased focus on teaching and learning andragogy, particularly as universities move away from the role of being "the (paramount) custodians of knowledge." New specialisations, such as practitioner academics, and "para-academics" were also discussed, as well as increased specialisation in digital, learning design and analytics to enhance learning outcomes.

INDUSTRY EXPECTATIONS

What we found

Industry (both public and private) is, in effect, a consumer of both graduates to employ and of research output. In that respect, industry has a significant role to play in the higher education sector.

[24] PwC Higher Education Workforce of the Future survey, 2015.



Industry as an employer

Anecdotally, a perceived disconnect exists between what some universities equip their students with, and what the public and private industry expects from "work-ready" graduates. University leaders are hearing that employers are increasingly looking for graduates to have more "soft skills" and competencies such as problem solving, critical thinking, communication, leadership, emotional intelligence and digital literacy (particularly in respect of collaboration), in addition to deep content knowledge and pure academic achievement. In fact, a recent study showed that the top two criteria for graduate hires were 1) interpersonal and communication skills, and 2) passion/knowledge of the industry, commitment and attitude. Academic achievement was ranked between third and seventh among ten criteria, across all industries.[25]

In future, it is expected that graduates will cycle through multiple career shifts,[26] requiring universities to equip students with skills that are transferable across disciplines and industries. Moreover, as already stated, 64% of university leaders believe that displacement of existing jobs with new jobs will be a key feature of the changing nature of work in the workforce at large. Worker job mobility is also a key feature of the changing nature of work in the workforce at large according to 45% of university leaders, further signalling a shift in the degree of agility required of the future Australian workforce.[27]

In terms of accreditation, some employers are now favouring graduates that have practical work experience, with degrees becoming less of a requirement. In some professions, industry experience is a necessary pre-requisite to securing a job, placing an increasing emphasis on the need for universities to have industry partnerships to facilitate work placements. There remains a question about whether accreditation will continue to have relative value over practical experience for some industry roles.

Industry as a research collaborator

University-industry R&D collaboration in Australia is low by international comparison.[28] It has been suggested that the growth of university-industry partnerships and collaboration seen overseas needs to be replicated in Australia to help attract research funding, encourage innovation and technology transfer, and provide access to greater resources.[29] Increased R&D collaboration may also present post-graduate and Higher Degree Research (HDR) students with increased opportunities for research and future employment.

[25] Graduate Careers Australia Report (2014).
[26] CEDA. Australia's future workforce? CEDA (2015).
[27] PwC, Higher Education Workforce of the Future survey, 2015.
[28] Australian Industry Group. Progressing STEM skills in Australia. AIG (2015).
[29] Zusman, A. Challenges facing higher education in the twenty-first century.

Universities will need to form partnerships with industry to reduce the gap between what universities are equipping their students with and what industry expects of their "work-ready" graduates.

The introduction of the federal government's Innovation Agenda in December 2015 provided greater certainty in terms of its investment in sciences R&D ($459 million over four years) as well as specific allocation of research block grant funding and broader effectiveness and impact measures to encourage collaboration between industry and universities.

This is to be done by giving "equal emphasis to success in industry and other end-user engagement as it does to research quality."[30] This signal to the sector will certainly heighten expectations for collaboration with industry, but also has the potential to shift the type of research that will be more (and less) likely to attract funding under the new innovation agenda.

However, despite the introduction of government policies to facilitate partnerships,[31] university leaders still perceive university-industry partnerships to be costly, noting "the financial constraints from industry [are] creating a crisis point".

The ability of universities and industry to form partnerships and share resources is inhibited by a lack of mobility in both directions between the university sector and industry. University performance management and promotion systems typically penalise those academics who wish to gain practical experience in public and private industry, due to the importance placed on research to achieve individual research productivity metrics and contribute to maintain university rankings. This deters academic staff from gaining industry experience, reducing the permeability between university and industry, and results in an immobile workforce.

Potential implications for universities

Australian universities currently engage public and private industry to varied degrees. Looking to the future, however, university leaders and other key stakeholders believe that greater permeability between universities and industry is required, and that the role of the academic will require appropriate and current

business acumen to operate in that environment.

In order to mitigate costs, universities will need to form partnerships with industry. The application of such partnerships may see industry funding input for course development to ensure graduates are "work-ready". Such partnerships aim to reduce the gap between what universities are equipping their students with and what industry expects of their "work-ready" graduates. University leaders generally believe that these partnerships are becoming increasingly important, with mutual benefits to both parties.

However, university leaders suggest that universities will need to drive the direction of industry engagement to ensure they will provide the most value for universities and their students, and may also need to consider partnerships with other education institutions to provide students with industry-based project work. In addition, the workforce requirements needed by universities to manage such partnerships will place further financial burdens on universities.

Potential workforce implications

If universities are to be more responsive to industry requirements for both employees and research, they will require greater workforce flexibility. From an employability standpoint this may potentially place a premium on multidisciplinary and continuous development models, by

[30] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report*, December 2015.
[31] Economist Intelligence Unit. The future of higher education: How technology will shape learning. The Economist (2008).

which academics can move across sub-disciplines (or disciplines) in an agile manner. From a research perspective, increased value may be placed on dedicated research academics who have greater commercial acumen and willingness to collaborate with industry.

To ensure the university workforce is equipped for the interface with public and private industry, universities will need a workforce that is comprised of a higher proportion of academics who have industry and inter-disciplinary experience. There might also be a need for a greater number of roles responsible for navigating the university's operation at that interface. Such permeability requires change by the sector: universities need to provide better career frameworks that support mobility in and out of public and private industry, and across professions. This includes an accreditation model that requires academics (both teaching and research) work in and out of industry with a performance framework that recognises and supports industry experience.

TECHNOLOGY

What we found

Technology has had a profound impact on the way we live and connect with the world around us. Technology has revolutionised how readily and easily people can access information, creating a "knowledge economy". University leaders believe this connected and far-reaching relationship with knowledge, through technology, has allowed institutions to have far greater reach than ever before.

The availability of online content and the expanded access to education means the role of universities in the creation and dissemination of knowledge is rapidly changing.[32] Universities are recognising this, with university leaders rating the "impact of pace and technological change" in the top three environmental factors most impacting universities in the next 10-15 years.[33]

The concept of the "digital native" sees Generation Y and later generations viewing technology as inherent to their way of being, and has implications for how future generations will expect to interact with knowledge providers. The average student worldwide will have 2.3 digital devices in their possession in the next three years,[34] and these digital natives expect that information and knowledge will be available at a time and place that is convenient for them, and on a preferred platform.

Furthermore, university leaders acknowledge that the notions of the 'traditional' campus experience and physical 'space' are being challenged by an ever growing market of technological and digital offerings that propel collaboration and social interaction into a virtual world. As a result, the ways of working and learning are no longer constrained by the physical environment, and there are no physical barriers to collaborating at any time from any location. There may be additional opportunities to digitise how universities engage with employers, and the role of technology in research collaboration.

There is a recognition that the sector must engage with technology to remain relevant to new and future generations. Students will no longer accept modes of learning that do not suit their own circumstances. However, technology is not necessarily a replacement for the traditional university experience for many students, and there will still be a requirement for differentiated learning (high tech versus high touch).

Potential implications for universities

The ability to access, create and share knowledge is having, and will continue to have, profound effects on the traditional notion of the university and academics, in particular, as "the custodians of knowledge."

While the impact of technology on higher education can already be seen, with email and online social networking facilitating collaboration, eJournals and eBooks helping disseminate knowledge, and open educational resources providing free access to courses and curricula, the ways in which universities operate will likely be challenged and disrupted even further in the years ahead.[35]

This is already apparent through the substantial growth of online learning products (generating USD$42.7 billion worldwide in 2014 and expected to pass USD$50 billion by 2018).[36, 37]

[32] Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012).
[33] PwC, Higher Education Workforce of the Future survey, 2015.
[34] Microsoft. *Windows for the way we learn presentation* (2013) (https://aer.microsoft.com/MEPN/decks/NEW – OEM presentation Windows for Education.pptx).
[35] Altbach, P. G., Reisberg, L., and Rumbley, L. E. Trends in global higher education: Tracking an academic revolution. UNESCO (2009).
[36] The Economist Intelligence Unit (2015), Connecting Universities: Future models of higher education: Analysing innovative models for Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka, January 2015.
[37] CEDA. Australia's future workforce? CEDA (2015).

In addition to varying degrees of flipped classroom models and digitisation for on-campus students, universities in Australia and globally have participated in the digitisation of course delivery to differing degrees. Many universities' first exposure was through engagement in massive online open courses (MOOCs) delivered by platforms such as Coursera and edX, which provided non-traditional students with free access to university course content on a non-accredited basis. In the past few years, some universities have provided increasingly online and flexible access to accreditation to students. Three examples are Deakin University, University of Arizona and IE in Spain, as shown in table 2 below:

Table 2: International universities increasing their digital footprints

University	Responses
Deakin University	Provides flexible learning opportunities through the provision of either fully or partly online courses using the university's online platform 'CloudDeakin'. Students who opt to learn through CloudDeakin receive the same qualifications or accreditation as those who study on campus.[38] Through CloudDeakin, students are able to access course materials, audio and visual presentations, participate in live real time conversations and streaming events and also complete assessments. The university has also recently signed a 'world first' deal with IBM to provide computerised support services to students powered by computerised learning using IBM's Watson technology. The university expects to use this technology to provide information to students ranging from simple 'how to' queries through to providing career advice.[39]
University of Arizona (USA)	The University of Arizona has recently launched 'UA Online', its new online campus which will provide over 50 courses online across both undergraduate and graduate programs.[40] Online delivery is not the university's only use of technology in learning, with technology enabled classrooms recently being developed to provide interactive learning spaces (interactive whiteboards, electronic capture software etc) to increase interactions and also make available learning lessons and conversations.[41] In addition, the university is continually looking at other ways in which technology can enhance student experience at the university. For example, the university has developed technology in house to assist its students connect with relevant scholarships available to them, using unique information on each student to assist and improve students chances of gaining scholarships.[42,43] The university also has strong links between its own technology research and innovation faculties and industry, recently announcing a partnership with Uber to further develop driverless car technology.[44]
IE (Spain)	With a large number of IE University's students combining study with full time employment, IE University has a strong focus on delivery of online content and ensuring content is made available to students 24/7.[45] As well as delivering content online, the university has also optimised digital library services, with access to a multitude of online content and access through extensive use of mobile app technology, allowing students to access resources flexibly.[46] The university has also invested heavily in technology within physical spaces, including smart technology at IE Library, allowing users to collaborate and share information with each other based on their location within the library, and the use of virtual assistants.[47] Further, IE University has joined forces with The Financial Times to create an alliance with a number of other leading business schools, including Yale School of Management and Singapore Management University, to provide a 'premium learning experience for business leaders' using a mixture of offline and innovative online learning methods.[48]

[38] Deakin University (http://www.deakin.edu.au/students/clouddeakin), January 2016.
[39] Itnews (http://www.itnews.com.au/news/deakin-university-to-use-machine-learning-for-student-support-396541).
[40] Campus Technology (https://campustechnology.com/articles/2015/03/24/u-arizona-launches-online-campus-with-21-undergrad-programs.aspx), March 2015.
[41] Campus Technology (https://campustechnology.com/articles/2015/04/29/u-of-a-preps-classroom-spaces-for-active-learning.aspx), April 2015.
[42] University of Arizona (http://inventions.arizona.edu/technologies/ua16-093_scholarship-universe), January 2016.
[43] Campus Technology (https://campustechnology.com/articles/2012/06/27/2012-innovators-university-of-arizona.aspx), June 2012.
[44] The Verge (http://www.theverge.com/2015/8/25/9207229/uber-university-of-arizona-tucson-autonomous-self-driving-cars), August 2015.
[45] Amazon Web Services (https://aws.amazon.com/solutions/case-studies/ie-business-school/).
[46] IE University (http://library.ie.edu/en/Home), January 2016.
[47] IE University (http://library.ie.edu/en/Services/Technologies), January 2016.
[48] Financial Times (http://aboutus.ft.com/2014/12/08/new-financial-times-and-ie-business-school-venture-to-provide-custom-education-for-executives/#axzz3wzv8TwrL), December 2014.

Much of what we read and heard suggested that digital disruption will have a more significant impact on teaching than on research, but research may also be disrupted. A number of eResearch centres have been created around Australia, with the aim of partnering with research groups to accelerate and transform research by connecting them with appropriate hardware, software and other services.[49] Beyond higher education, other sectors are seeing artificial intelligence and supercomputing disrupt the fundamental nature of their work, as outlined in the case study below.

University leaders believe that, as it has in other sectors, technology has significantly lowered the barriers to entry in the education sector. Like the oft quoted and never cited truism that suggests Uber is the world's largest taxi company yet owns no vehicles, and Airbnb is the world's largest accommodation provider yet owns no real estate, new entrants to the online education market are not bound by the need for expensive infrastructure.

Case study 1: The Healthcare Sector and Digital Disruption[50]

Artificial intelligence enables computers to compile large volumes of information and perform some tasks with greater accuracy and efficiency than humans. For example, IBM has developed a computer called 'Watson' and is now using this technology to perform functions such as medical diagnosis, by using the technology to read large amounts of medical literature and correlate this with patient symptoms.

A physician can describe symptoms and related factors to the system and Watson can then identify key pieces of information, mine the patient's data to find relevant facts and combine this information with findings from tests. Watson then forms and tests hypotheses by examining a variety of data sources. The system can also explain to a human physician how the conclusion was reached.

IBM has been working with hospitals and research organisations in the United States to advance Watson's healthcare capabilities and transform how medicine is taught and practiced, and is investing in start-up organisations that are building apps and services that are powered by Watson.

This technology is likely to have a significant impact on the healthcare sector going forward, in particular the healthcare workforce. It is likely to improve the accuracy of diagnoses, including by analysing and storing more data than human medical practitioners are able to, as well as staying abreast of all medical developments. It is also predicted that with the support of this technology to conduct quick diagnoses, the number of patients that doctors can assist will rise and there may be a need for fewer doctors per head of population.

POTENTIAL IMPLICATIONS FOR THE HIGHER EDUCATION SECTOR

Rapid advances in these types of technologies have implications for the higher education sector. In the future, technologies such as Watson will be able to perform an increasing number of tasks currently conducted by humans in all sectors, for tasks that are both low and high skilled.

In the higher education sector this technology will see a shift from the digitisation of content already used in teaching, through to the use of eResearch, for example: artificial intelligence for research purposes for instantaneous literature research, synthesis, data analytics and visualisation. While the implications for the sector are profound, the higher education workforce will first need the skills and capabilities to use this technology. It also presents opportunities for the sector to work with technology companies and the healthcare sector (and other sectors) to continuously advance these types of technological innovations.

Higher education institutions will also increasingly need to teach science, technology, engineering and mathematics (STEM) skills, digital literacy, and competencies in navigating and evaluating content, rather than focusing on knowledge retention.

[49] Monash University eResearch Centre website (https://platforms.monash.edu/eresearch/), December 2015.
[50] CEDA, Australia's future workforce? CEDA (2015).

In the opinion of a great number of sector stakeholders, increased competition from online providers, coupled with the increasing expectation of the digital native generations, is forcing universities to make a decision (consciously or otherwise) on the level of technological engagement they use. Many point out that the potential differentiation for universities lies in the practical experience provided, the offerings of the physical space, and the skills (such as interpersonal skills) that foster through a physical learning environment. While campuses will remain a valuable offering and experience to students, digital technologies will transform the way education is delivered and accessed.[51]

In response, many universities globally offer blended learning,[52] where students are taught using a mix of online and face-to-face learning. In Australia, our universities are recognising the trend, with a "greater reliance on online delivery of core course material" identified by university leaders as the top consideration for future university business models.[53] In order to give students the choice, flexibility and accessibility they seek, blended models of delivery will likely need to provide content through technological platforms which are accessible 24/7, while also providing face-to-face opportunities for those who value personal interaction.

While technology presents challenges for the traditional notion of the university campus experience and andragogy, it also presents opportunities for better engagement with new and future generations.

The use of Learning Management Systems (LMS) and "Big Data" will give universities the ability to monitor learning tools and run analytics to better tailor courses, content and performance management, while collaborative platforms will provide the connectedness that digital natives inherently value.

Potential workforce implications

Given the potential impact of technological disruption, academics need to be equipped with the ability to navigate a digital and blended learning and research environment. This could be supplemented by increased investment in roles specifically engaged to design digitally enabled, interactive content. For researchers, the take-up of technology (in respect of online journals and search capability, and e-collaboration) and the concept of eResearch will require a skill and capability base to utilise new and emerging technologies in order to accelerate and transform the way research is conducted.

The increased role of LMS and big data to improve the learning experience will also require greater capability to support data management and analytics, so that the evidence base can be effectively exploited to inform decision making.

[51] Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012).
[52] The Economist Intelligence Unit (2015), *Connecting Universities: Future models of higher education: Analysing innovative models for Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka*, January 2015.
[53] PwC, Higher Education Workforce of the Future survey, 2015.

Only 5% of university leaders rate their employee value proposition as being "very high"...

COMPETITION

What we found

According to university leaders, "increased global competition" is in the top four environmental factors most likely to impact universities in the next 10-15 years.[54] The introduction of a demand-driven funding model in Australia in 2012 has further increased competition, with some universities seeing their market shares decline by 5-10%.[55]

Australian higher education institutions are competing for a number of scarce resources in order to be sustainable:

1. **Domestic and international student enrolment**
   Australian universities have historically competed locally, within their State, for Australian student enrolment; Australian undergraduate students, unlike their US and UK counterparts, for the most part reside with their parents during university. The explosion of the Asian middle class has seen families sending their children abroad to study, resulting in a significant increase in the competitive environment in the past two decades, and this is likely to continue as the Asian middle class continues to grow. Mobility has allowed students and academic staff to pursue the "best" institutions, which is still largely based on university rankings that are based largely on research only, rather than teaching quality. The intensity of the competition amongst universities trying to secure international students is high, as revenue/international student is far greater than revenue/local student. While the increasing mobility of students and academic staff has created opportunities to access a broader pool of students and staff, the reduction in government funding being experienced internationally has meant that global competition for students has reached new levels of intensity.[56]
2. **Academic talent**
   In addition to the movement of talent due to competition in the domestic market, (where researchers are highly sought after in the corporate sector), students and academics are also increasingly opting to study/work/research abroad. University leaders are concerned about the threat from the growing quality of Chinese, Indian and south east Asian universities, and the implications for the flow of talent to these countries.
3. **Professional talent**
   University leaders acknowledge that professional staff are becoming increasingly mobile, with skills transferrable across the higher education sector, and all corporate and government sectors. This has led to increased competition for professional talent in universities across the country, in addition to the competition that other sectors present.

While Australian universities are competing with global universities for academic and professional talent only 5% of university leaders rate their employee value proposition as being "very high," suggesting difficulties for competing for talent on a global scale.[57]

Furthermore, Australian universities will increasingly be competing with global universities that are accessible via digital means. Online courses and MOOCs will provide students accessibility to international university courses without having to leave their country. Therefore institutions that provide digitally advanced online offerings may be in an advantageous position.

Universities are faced with competition from a growing number of private education providers, including NUHEPs and emerging private competitors (e.g. Telstra, SEEK) that are now entering or considering entry into the education sector. These private education providers accounted for 30 per cent of global higher

[54] PwC, Higher Education Workforce of the Future survey, 2015.
[55] Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012).
[56] Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012).
[57] PwC, Higher Education Workforce of the Future survey, 2015.

education enrolments in 2009.[58] University leaders acknowledge that private institutions with specialist offerings will serve as another point of competition, with low barriers to entry and the ability to offer cheaper courses. Furthermore, many employers now choose to tailor and deliver their own training and professional development courses.[59]

Potential implications for universities

In response to environmental impact factors such as changes to funding and student expectations, a different breed of higher education institution is emerging, as universities have altered the way they are managed and operate. While universities are still responsive to both government and the public, they are forced to run more like a business. This includes achieving efficiencies, higher productivity, competitiveness, flexibility and agility. Like businesses, they need to respond faster, minimise overheads and change strategy and direction in response to markets, trends and opportunities.[60]

To ensure financial sustainability, universities are responding by experimenting with new offerings. To raise revenues, reduce costs and generate efficiencies, some institutions have implemented and are likely to continue pursuing to varying degrees: increasing international student enrolment, exploring partnerships, introducing shared services arrangements and more efficient staffing policies.[61] Universities will also need to diversify their revenue streams to reduce reliance on government funding, which is becoming increasingly scarce with more competition, and have lesser reliance on international students in driving revenue.

The increase in competition nationally and internationally has led universities to consider what type of experience they are providing to students and whether it is one that students value. Students have choice in what university they attend and place emphasis on the university's value proposition. It is also likely that some universities may start to integrate specialist offerings for niche markets. This implies a workforce with specialist skills, particularly teaching skills and professional experience, and according to university leaders, a workforce with skills that are transferable across boundaries.

Additionally, university leaders expect that increasing international competition will, over the medium term, lead to new, highly ranked universities with world-class facilities in countries that are currently sources of international students for Australian universities. The implications of this are significant, as it may lead to a reduced inflow of international student enrolments, and potentially an outflow of Australian students to the same international universities.

Students are now viewed (and increasingly view themselves) as customers, with institutions forced to compete for customers and funding. A significant percentage of graduating students do not receive their degree from the first institution they attend, suggesting that if a university doesn't offer students quick, simple, flexible and unique solutions, they will go elsewhere. They will also often seek to "trade up" to a higher ranked university. Universities need to consider if their workforces have the business acumen to interact with players outside the university, particularly professional industry.[62]

Changes could include unbundling of components offered by universities (e.g. just offering lectures and tutorials, or offering assessments to attract students that want to tailor their own university experience). To help attract and retain students, price freezes and price guarantees are now being offered for the duration of a course. In addition, there are guarantees on the time it will take to complete a course, credits are awarded based on competency levels rather than set times, and lower-cost degrees have been developed. For example, students at Western Governor's University, Southern New Hampshire University, Wisconsin Extension Centre, Westminster University, and Capella can take a test to show their competency and gain credits without taking the course.[63, 64]

In a time when competition for funding and resources is intense, there is a need for universities to collaborate with each other to mitigate the risk of losing out to external competition. To reduce the increasing competition from private institutions, universities will need to consider partnering with other institutions to increase their competitive advantage.

Potential workforce implications

In order to support greater collaboration both inside and across universities, a culture of collaboration, innovation and agility will be required. Anecdotally, university culture has had the tendency to operate in a siloed manner, and new methods of operating will challenge that culture.

More importantly, higher education institutions in Australia need to have agile decision making frameworks and organisational structures in place that embrace and leverage both advancing technologies and human capital. Doing so will enable universities to adapt business models that are innovative, responsive and cutting-edge, giving them a competitive advantage in the market for students, staff, research, funding and partnerships.[65, 66]

[58] Altbach, P. G., Reisberg, L., and Rumbley, L. E. Trends in global higher education: Tracking an academic revolution. UNESCO (2009).
[59] CEDA. Australia's future workforce? CEDA (2015).
[60] Deloitte, Higher education is evolving: As the business model changes, the governance model must too.
[61] Lapovsky, L., *The Higher Education Business Model: Innovation and Financial Sustainability*, TIAA-CREF Institute report (2008).
[62] Deloitte, Higher education is evolving: As the business model changes, the governance model must too.
[63] Lapovsky, L., *The Higher Education Business Model: Innovation and Financial Sustainability*, TIAA-CREF Institute report (2008).
[64] Lapovsky, L., *The Higher Education Business Model: Innovation and Financial Sustainability*, TIAA-CREF Institute report (2008).
[65] CEDA. Australia's future workforce? CEDA (2015).
[66] Deloitte, Higher education is evolving: As the business model changes, the governance model must too.

STUDENT EXPECTATIONS

What we found

As a greater diversity of students (more international, mature age, low socio-economic status and part-time) enter higher education, the expectations of all students need to be considered. The higher education system is now expected to provide timely and responsive support facilities and services, flexibility in teaching and learning, the use of more connected and mobile technologies in teaching and learning, and better employability outcomes. Many universities are unable to fully meet these demands, with a gap emerging between student expectations and student experience.[67] One Vice Chancellor told us "What I spend the most time worrying about is what are our students thinking about? What are they worried about? If their expectations change, we're bankrupt."

Stakeholders presented mixed views regarding the extent to which student expectations would become a greater driver of change than has historically been the case. However, we subscribe to the majority view that the expectations of current and future generations of students will be a greater determinant of the education experience than their predecessors.

This is due to a range of factors, including increased global competition for students (both online from top tier schools, and in Asia as a traditional source of international students that will diminish over time), the fact that students are paying more for university education, and a higher proportion of mature age students are arguably more discerning consumers of services from universities.

From the perspective of university leaders, the principal changes that will need to be made to student experiences to meet student expectations in the next 10-15 years are outlined in figure 2 below.[68]

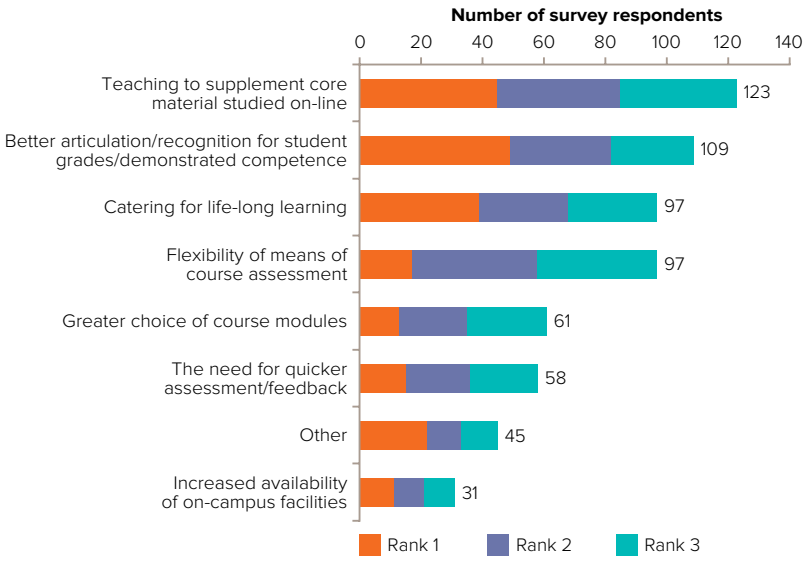
Australian students today are only moderately satisfied with their learning experience, expecting a more customer-focused and convenient offering. These opinions have only changed minimally since 2012.[69] When asked what they would like to ask their Vice Chancellor, questions such as "If I don't get a graduate job in my field when I graduate, what will you do?" and "How will you secure my future?" suggest that students place a great deal of trust, and accountability, in their universities to help them realise their goals.

Students told us that they expect their university to build the necessary industry partnerships to create job opportunities through placements and ultimately employment.[70] This was echoed by CAPA, who noted that the need for employability will be a significant driver of how universities deliver learning in the next 10-15 years.

Further, students expect their education to be focused on what employers are looking for, to help them compete for the jobs of the future.[71] Many felt that there was disconnect between what is taught at university and what is immediately useful in a work context.[72] There were clear gaps articulated by students and employers when asked how "ready" they were for work as graduates and both populations agreed on the types of "non-technical" skills required – common themes being communication, time-management and confidence. In addition, there was a mutual view that it was hard for students to translate the experience and skills gained during "extra-curricular" activities using language that employers value.[73] Given the fees students pay for their education, we heard from university leaders that "value for money" is increasingly important.

The importance of "flexibility" came up repeatedly in the student workshops, with students and recent graduates expressing that they do not like having to choose their major field so early in their studies. They expressed views such as "don't force students to pigeon hole themselves early in their degree" and "let students try many

Figure 2: Changes to the student experience required of universities in the next 10-15 years



[67] Institute for Teaching and Learning Innovation. Future trends in teaching and learning in higher education. Institute for Teaching and Learning Innovation, University of Queensland (2015).
[68] PwC, Higher Education Workforce of the Future survey, 2015.
[69] CEQ Survey Results (2014).
[70] PwC led student discovery workshops, sample 50 (Oct, 2015).
[71] CEDA. Australia's future workforce? CEDA (2015).
[72] PwC led student workshop, sample 11 (Nov, 2015).
[73] PwC led student discovery workshops, sample 50 (Oct, 2015).

disciplinary areas before committing to a major" and suggested that a structured and rigid course structure discourages creativity and imagination (recognising that this view may apply for some disciplines more than others). In addition to a flexible course structure, students are also looking for flexibility in the material covered to ensure it is always relevant to the current environment, and flexibility in the delivery mechanism to suit their personal circumstances.[74] Increased flexibility in course constructs and materials would need to be tested against accreditation, including the AQF, and industry requirements.

With regards to technology as a delivery mechanism, between 2005 and 2010, mobile technology use amongst higher education students rose dramatically, from 1 per cent to 63 per cent.[75] The changing student population and development of mobile and digital technologies has seen a switch in expectations amongst students. Students are no longer passive observers, but contributors and co-creators of knowledge.[76] They are used to getting what they want in real-time, and expect university services to be responsive, customer-focused and available 24/7.[77, 78] Most are now frustrated when they are not afforded the flexibility in teaching and learning that mobile technology allows them to collaborate, discuss, interact with and create knowledge at any place and at any time.[79] This correlates strongly with the university leader comments that "24/7" learning such as the Deakin "study anytime" model will become much more common in the future, and comments from students that technology used by their university needs to be seamlessly integrated into other technology they use, not an "extra."

Students stressed the importance of not "losing the human touch" from the university experience and not losing the "social aspect" of the campus experience, many highlighting that at crucial points in their courses they relied heavily on 1:1 support from their lecturers and tutors, which could be enabled but never replaced by technology (for example, using virtual collaboration tools for the meeting). Along similar lines, they suggested that if courses were increasingly flexible, a "course counsellor" or coach was seen as an important role to work in partnership to help students navigate the options available to them.[80]

Outside of Australia, the UK has introduced the Key Information Set (KIS), which comprises information (i.e. metrics which students have said they find most useful when making choices about which courses to study) for students and potential students.[81]

The University of Liverpool presents an interesting example of adapting to changing student needs and behaviours. Students learn in an online environment where courses have no fixed structure: there are no lecture times, students can interact with their instructors and fellow students at any time, and they can customise their degree programmes to suit their needs and career priorities.[82]

"What I spend the most time worrying about is what are our students thinking about? What are they worried about? If their expectations change, we're bankrupt."

– Australian Vice Chancellor

[74] PwC led student workshop, sample 11 (Nov 2015).
[75] Rossing, J. P., Miller, W. M., Cecil, A. K., and Stamper, S. E. iLearning: The future of higher education? Student perceptions on learning with mobile tablets. Journal of the Scholarship of Teaching and Learning; 12(2): 1-26 (2012).
[76] CEDA. Australia's future workforce? CEDA (2015).
[77] Economist Intelligence Unit. The future of higher education: How technology will shape learning. The Economist (2008).
[78] CEDA. Australia's future workforce? CEDA (2015).
[79] Rossing, J. P., Miller, W. M., Cecil, A. K., and Stamper, S. E. iLearning: The future of higher education? Student perceptions on learning with mobile tablets. Journal of the Scholarship of Teaching and Learning; 12(2): 1-26 (2012).
[80] PwC led student workshop, sample 11 (Nov, 2015).
[81] Unistats. *The Key Information Set*. https://unistats.direct.gov.uk/find-out-more/key-information-set.
[82] The Economist Intelligence Unit, Connecting universities: Future models of higher education: Analysing innovative models for Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka, An Economist Intelligence Unit report produced for the British Council, January 2015.

Potential implications for universities

In order to meet the expectations of students of the future, higher education overall will become increasingly virtual, flexible, customised to meet the needs of individuals and be delivered in partnership with public and private industry. We believe universities will increasingly need to make choices about how they go about meeting student expectations and their "offer". These choices will need to exist within the constraints of what universities must include in certain courses under the AQF.

The backgrounds, needs, and opportunities for future higher education students will require more varied and holistic approaches to learning and investment in the 'student experience'.[83, 84] Students will expect to be able to interact with peers and instructors at any time and in real-time, through the use of online tools and digital platforms.[85, 86] The next generation of learners will also demand more personalised learning, with individualised degree programs crafted to meet their specific needs and objectives at a price they can afford.[87, 88] Universities will be expected to offer a learning experience that involves industry in more meaningful ways, from offering industry placements that improve understanding of on-the-job requirements, to co-design and co-delivery of curricula.[89] There is huge potential for user-led design of the future, utilising the energy and passion that students, employers and the community have for this important topic.

Potential workforce implications

A greater diversity in student learning and experience needs, coupled with changing expectations over the coming 10-15 years, means that greater flexibility and specialisation in roles will be needed. We believe this will translate to a greater demand for andragogy, learning designers and career counsellors as demand continues for teaching quality and access to education and career support. Demand for real-time and anytime support, particularly for universities with an increasingly global and online offering, could also put pressure on traditional "hours of work" constraints and give rise to para-academic roles.

Where universities respond to the increasing focus on employability, roles and capability relating to industry interface will be important.

[83] Flynn, W. J., and Vredevoogd, J, "The Future of Learning: 12 Views on Emerging Trends in Higher Education", *Planning for Higher Education*, January-March 2010.
[84] Australian Higher Education Industrial Association, Faculty Bargaining Services, and The Universities and Colleges Employers Association. Contingent academic employment in Australia, Canada and the United Kingdom. 2014.
[85] Economist Intelligence Unit, The future of higher education: How technology will shape learning, 2008.
[86] Intuit. Intuit 2020 report: Twenty trends that will shape the next decade. Intuit (2010).
[87] Intuit. Intuit 2020 report: Twenty trends that will shape the next decade. Intuit (2010).
[88] Economist Intelligence Unit, The future of higher education: How technology will shape learning, 2008.
[89] Flynn, W. J., and Vredevoogd, J, "The Future of Learning: 12 Views on Emerging Trends in Higher Education", *Planning for Higher Education*, January-March 2010.

POLICY AND FUNDING

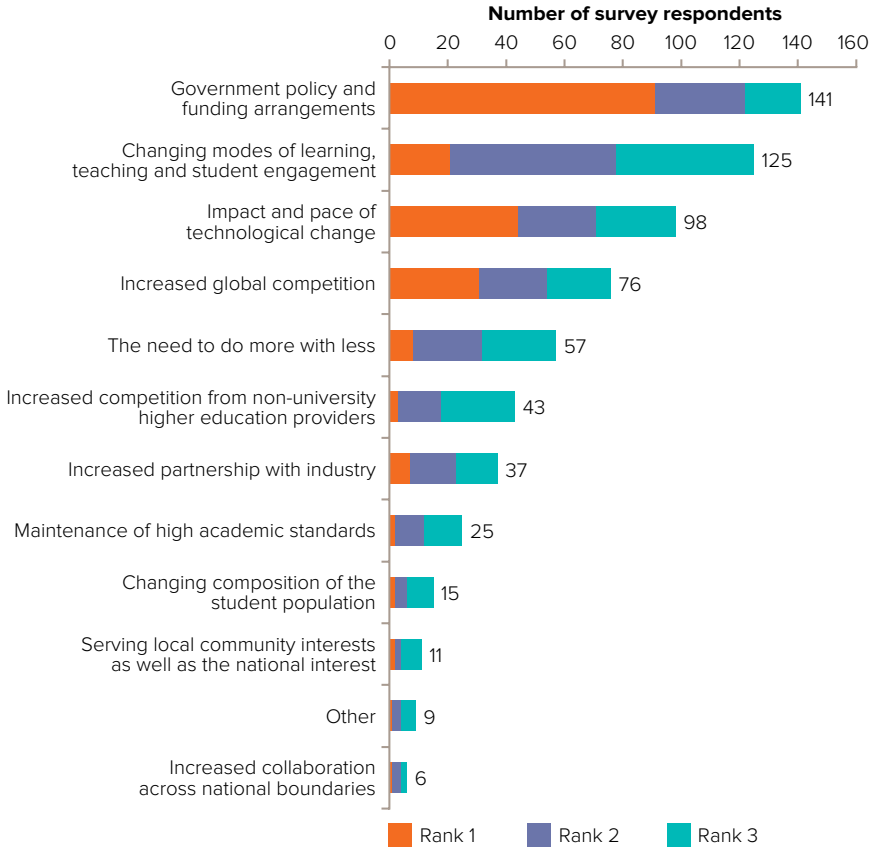
What we found

University leaders are concerned by the potential impact of both funding and broad-based government policy on the economic environment in which universities will operate in the next 10-15 years. While fee deregulation has been deferred for the coming fiscal year, the potential long-term impacts are still seen as highly relevant, with 66% of university leaders believing government policy and funding to be one of the three most significant drivers of change over the next 10-15 years, and 42% ranking it the highest (the highest response of any of the drivers), as outlined in figure 3 below:[90]

As noted in earlier sections of this report, there are a range of other factors shaping the debate, including the demand-driven model, "massification," the importance of rankings, and perceived shift in focus of research funding from pure toward translational and applied. The latter will continue to evolve and shape the nature of research funding, and which types of research are and are not self-sustaining over the long term.

Over the past decade, the amount of government financial support per student has progressively declined, and enrolment has increased, meaning universities are forced to 'do more with less.'[91] According to the OECD, since 1995 Australia has fallen from 6th to 24th out of the 25 OECD countries for public investment (excluding private investment) in

Figure 3: Key environmental factors with the most impact on universities in next 10-15 years



[90] PwC Higher Education Workforce of the Future survey, 2015.
[91] Australian Higher Education Industrial Association, Faculty Bargaining Services, and The Universities and Colleges Employers Association. Contingent academic employment in Australia, Canada and the United Kingdom. 2014.

higher education as a share of GDP (1.2% in 1995 to 0.74% in 2011), reflecting the shift in government policy over that period.[92]

In addition, the levels of research and development funding by government in Australia is at a 30-year low as a percentage of total budget spending, growing (2.0%) at less than half the rate of total spending (4.4%) over that period.[93]

Generally, this has meant the shortfall in revenues has been met by domestic and international student fees. Twenty-one percent of public university revenue in 2013 was comprised of direct fee contributions (primarily from international students), up from 13% in 1997.[94] As domestic enrolments have increased in recent years (and international enrolment has slowed), government contributions have increased. However, the Grattan Institute hypothesises that due to the subsidisation of research with teaching revenues in the sector, deregulation would significantly increase the proportion of revenues comprised of student contributions.[95]

Anecdotally, universities have responded to changes in the funding environment through identification of incremental efficiencies and productivity improvements. This has been paired with increased domestic enrolments, and an increasing reliance on international students, in effect increasing admissions such that scale can sustain the cost base. The combined result was a significant rise in student teacher ratios.

The uncertainty of the impact of funding in the sector is punctuated by the current alternative federal government proposing to re- introduce fee caps should it be elected at the next federal election, which could have significant yet not broadly considered consequences.

Of the change drivers discussed in this report, in some ways changes to funding and policy are the least certain, with funding arguably having the largest potential impact on university decision making over the next 10-15 years.

[92] UA Higher Education and Research Facts and Figures Nov. 2015.
[93] Fairfax Media, *Australian Government investment in science reaches 30-year low*, September 2014, (http://www.smh.com.au/technology/sci-tech/australian-government-investment-in-science-reaches-30year-low-20140924-10lbwk.html).
[94] Grattan Institute, Mapping Australian higher education, 2014.
[95] Grattan Institute, Mapping Australian higher education, 2014

Potential implications for universities

Looking into the future, most Vice Chancellors (and sector university leaders more broadly) believed that the current funding model was likely to be disrupted, generally with the result of further restriction of government funds to universities, and with the outcome that students would be required to contribute more. This was believed to have several possible implications:

- As Commonwealth funding per student reduces, students are paying more for their education, and potentially receiving less tailored (or lower quality) education. In this scenario, students, as more significant contributors to the sector, have greater influence over how their contribution is spent, and are more selective in their university decision, resulting in universities catering more directly to student demand. This could put pressure on funding allocation, the student experience, class sizes, and focus on employability.
- A Grattan Institute report on funding of Australian universities called into question the cross-subsidisation of research through income generated by teaching.[96] Government policy has the potential to drive questions around the "enshrined" 40/40/20 (teaching, research and engagement) academic workload allocation model, particularly when combined with changes to student expectations about how their contributions will be spent.
- With a shift in the research funding environment, there is likely to be a change in the types of research undertaken by universities in response (e.g. more translational and applied, focus on innovation, STEM, etc.), and an increase in collaboration with industry required. Some universities may also look to global sources of research funding, which requires greater virtual collaboration capability. As discussed in earlier sections, this will result in increased partnering outside of the university sector. It may also result in universities scaling back, and even discontinuing, research in areas that are not aligned to this environment, or where programs are not differentiated, and thus no longer financially viable.

A number of changes to university business models, in response to the potential challenges presented by uncertainty in funding and policy, were suggested by sector stakeholders:

- Greater specialisation and diversification, driven by universities playing to their respective strengths, would result in different areas of focus (i.e. with some continuing to maintain research focus, and others aligning more closely to industry to ensure student employability) and thus funding allocations. This would result in a more segmented, competitive environment, and it is likely some universities would begin unwinding their research capability, and focus more on teaching and engagement.
- Increased collaboration inside of, and external to, universities, across teaching, research and engagement to maximise increasingly constrained resources may become more commonplace. As one Vice Chancellor commented "Resources will be scarce, funding will always be tight. If we don't learn to collaborate, there is a risk [to the sector]." Our survey findings indicated 58% of university leaders believe "greater collaboration with other entities for course delivery" is among the top three future directions for university business models (with one-third ranking it as the most likely outcome).[97] We believe that trend will also hold true for the future of research.
- Further efficiencies will continue to be sought across the higher education cost base, particularly through more efficient delivery and administration. Technology will continue to be explored to scale up capacity and identify alternate access and delivery mechanisms, whilst shared service arrangements could be explored to create efficiencies in the way in which administrative services are delivered; this could span across multiple universities for "back of house" functions.

[96] Grattan Institute, The cash nexus: how teaching funds research in Australian universities, 2015.
[97] PwC, Higher Education Workforce of the Future survey, 2015.

- Continued diversification of revenue streams will be front of mind as universities face funding uncertainty. In recent decades, universities have looked to the international student market to mitigate this impact. In 2013, roughly 25% (or 330,000) of students enrolled in Australian universities were international students.[98] However, given the potential volatility in this market and tapering of international enrolments since 2010,[99] universities are increasingly looking to create commercial linkages with industry. 62 per cent of survey respondents believed that opportunities to improve engagement with industry R&D represented one of the three most likely implications for university business models, and almost 20% believed it was the most significant.[100] This requires universities to build significantly deeper relationships with industry in order to collaborate on the development and delivery of teaching and learning programs, and as a source for support and collaboration on activities relating to research and innovation.[101]

A minority of Vice Chancellors believed that funding would not significantly impact the university operating environment, believing instead that market pressures, and particularly students' ability to exercise choice in the higher education market, would be the more significant driver of change. However, the two drivers are highly interrelated, as stakeholders generally believed some student behaviour would ultimately be influenced by their exposure to fee increases and debt burden.

Potential workforce implications

For universities where realignment of funding allocation may be required, flexibility and diversity in academic role focus will likely follow. In the case where universities are disproportionately funding research from teaching and learning revenues, some may choose to reduce the expectations for each academic to allocate 40% of their time toward research endeavours, which would lend itself to greater role specialisation over time.

We believe there will also be an increased need for academics to be able to engage externally both in the teaching and research spaces – with industry, other educational providers, and the sector globally. Roles and capabilities (including business acumen) will be needed for academics to operate in this new environment.

Additionally, student behaviour in response to increases in their financial contributions and debt over time will put pressure on value for money of education, and may challenge universities in how they spend on the workforce, particularly in relation to the elements of the experience to which students place lower importance on. This will differ across universities, depending on their relative strengths.

[98] Grattan Institute, Mapping Australian higher education, 2014.
[99] Grattan Institute, Mapping Australian higher education, 2014.
[100] PwC survey, Higher Education Workforce of the Future survey, 2015.
[101] Ernst & Young. University of the future: A thousand year old industry on the cusp of profound change (2012).

WHY ACT, WHY NOW?

The Foundation for Young Australians predicts that today's young people will hold as many as 17 different jobs, in five different careers, over the course of their working lives.[102] A 2015 study by PwC Australia found that 44% of 5.1 million current Australian jobs are at risk from digital disruption in the next 20 years, and that 75% of the fastest growing occupations require STEM skills.[103] Australian universities are integral to training a qualified and adaptable labour force, increasing the supply of skilled workers available to the economy, to meet these changing expectations.[104]

However employers will be required to invest more than in the last 10-20 years in further training, no longer placing emphasis on new hires obtaining university education.[105] This is already becoming apparent in other jurisdictions. For example, Ernst & Young (EY) in the UK announced that they will remove degree classification from their entry criteria in 2016. Maggie Stilwell, EY's Managing Partner for talent said "there's no evidence to conclude that previous success in higher education correlated with future success in subsequent professional qualifications undertaken." [106]

We believe that universities may begin to experience pressure on enrolments, as students see less value in needing to be university educated. Universities need to address these employer concerns, as well as ensure students are better equipped to contribute to the economy through being successful entrepreneurs, holding a diverse number of jobs and/or working across a number of industries.[107]

While we are better equipping our students for their futures, there is also a need to focus on the role of innovation and research in Australia's future. Our economy is in the midst of a 'great transition' and the federal government has focused attention on the role that innovation and research play in improving economic and social outcomes and in transforming Australia. University research lies at the heart of this transformation. For every dollar invested in university research, between $5 and $10 is returned to the national economy – equivalent to an annualised return of 60-100%.[108]

[102] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report*, December 2015.
[103] PwC, A Smart Move – STEM Report, April 2015 (http://www.pwc.com.au/stem.html).
[104] Deloitte Access Economics, *The Economic contributions of Australia's research universities – the UNSW example*, October 2015.
[105] PwC led employer discovery workshops, sample 60 (October 2015).
[106] Times Higher Education, *Ernst and Young drops degree classification threshold*, August 2015 (https://www.timeshighereducation.com/news/ernst-and-young-drops-degree-classification-threshold-graduate-recruitment).
[107] National Innovation & Science Agenda, *'Welcome to the ideas boom' Australian Government report*, December 2015.
[108] Deloitte Access Economics, *The Economic contributions of Australia's research universities – the UNSW example,* October 2015.

The federal government's innovation report recognises that Australian innovation is significantly under-performing globally.[109] The countries that are high performers on innovation measures are those where there is a high level of engagement between universities and industry.[110]

While the federal government is making changes to research funding and incentivising university-industry partnerships through its innovation agenda, other challenges in employer and student expectations, the recognition of STEM and the need for collaboration across the sector will all see demands on universities increase. While some universities will be better placed than others to take this challenge forward, all universities need to respond to ensure Australia continues to have a well equipped and more highly skilled workforce that is adaptable and agile for the future.

Australian Prime Minister Malcom Turnbull articulated an intent for the country in his first speech as Prime Minister, saying *"The Australia of the future has to be a nation that is agile, that is innovative, that is creative... change is our friend if we are agile and smart enough to take advantage of it."* [111] We believe there is an imperative for the higher education sector to take more of a lead in rising to this challenge, supporting the development and opportunities of future generations.

[109] AAMC Australian Innovation System Report, 2014 (http://www.industry.gov.au).
[110] Boosting high-impact Entrepreneurship in Australia, Office of the Chief Scientist, October 2015.
[111] Malcolm Turnbull speech, September 15 2015 (http://www.malcolmturnbull.com.au/media/transcript-vote-on-the-liberal-party-leadership).

REIMAGINING THE WORKFORCE

We have outlined the environmental drivers expected to impact the higher education sector over the next 10-15 years and, as noted, the implications for the workforce are significant. The workforce structure, capability and engagement dimensions will require a number of changes in order for universities to appropriately respond.

We identified in the previous sections the three key future workforce attributes - agility and flexibility, professionalisation and specialisation - that we believe all university workforces will need to exhibit.

In order to achieve a future workforce reflective of these attributes, we believe there are a range of options that universities should consider across three workforce dimensions:

a. **Workforce capability**
The skills, capabilities, experience and behaviours required of university staff and leaders in order to deliver on strategic intent and sustain competitive advantage.

b. **Workforce structure**
The design of new and existing roles to better meet the academic, research and service requirements of universities.

c. **Workforce engagement**
The manner in which capability is matched to the workforce structure, through contract models, investment in development and the talent pipeline, as well as performance and reward arrangements to align individuals with the strategy.

In anticipating greater diversity of value propositions across Australian universities in the future, we expect the way in which universities implement these options will vary significantly from institution to institution.

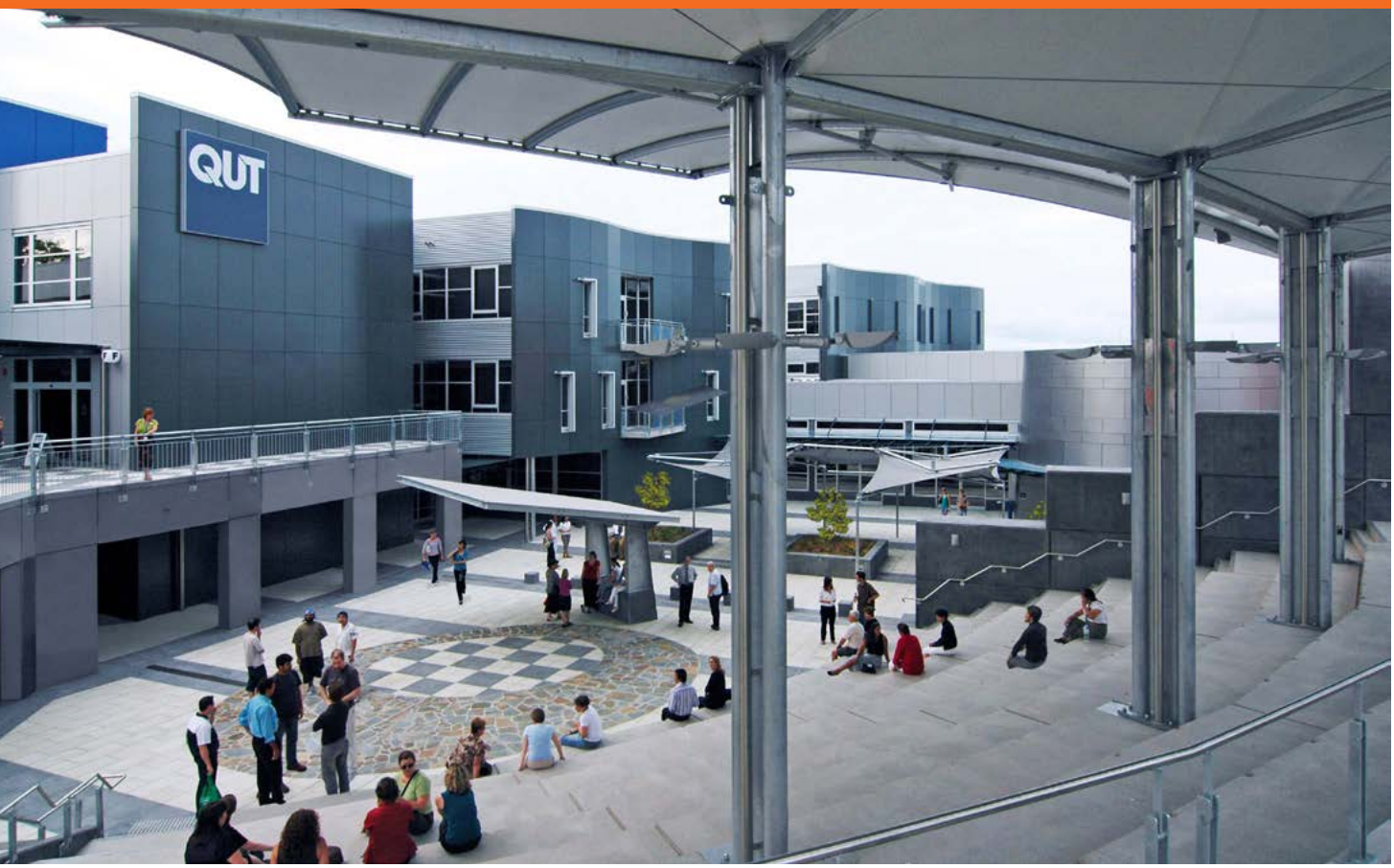
The following sections provide greater detail for the full set of twelve options we have identified to support universities to achieve their future workforces.

WORKFORCE CAPABILITY

The capabilities and characteristics required of the workforce to deliver in the future university environment are likely to look different from today.

Table 3: Workforce capability options

Options
Changing skills requirements: the aggregated effect of the external drivers means that skills requirements will not only be different in 10-15 years, but that change in requirements will be endemic to the sector. Four skills emerged consistently: • An increase in technology skills across the university workforce to optimise digital potential (e.g. efficient use of technology in teaching and research) and student experience and expectation, as well as increased research requirements • A shift from traditional knowledge creation and dissemination for teaching and learning roles toward facilitation and practical application, driven largely by digital availability and accessibility of knowledge (i.e. teaching the things that Google cannot readily answer) • Deep teaching expertise, as academics who are teaching and learning experts will find it easier to make the move between sub-disciplines as student and industry demand shifts over time • In order to make data-based decisions (for both teaching and research), analytics skills will need to increase
Leadership: a focus on the quality of leadership to lead change in the sector, in an era of continuous change and improvement: • The ability to influence in a historically sceptical and change resistant environment, by developing the narrative and vision, and energising the workforce around the change • The commercial acumen required to understand the cost implications of responding to the challenges and opportunities driven by external factors (i.e. do we understand our current cost base?), and the implications of not changing
Experience: the need for academics to increasingly bring a practical lens to supplement theoretical teachings in the classroom and research fields: • Having practical and industry (both private and public) experience to enhance the culture diversity of workforce experience outside of academia (see career paths below)
Behaviours: the requirement of the future workforce to respond to the increasing pace of change and external disruption means that some behaviours are likely to be valued more than they were historically: • Change agility – the workforce's ability to be agile in the face of sector uncertainty and change • Collaboration – including the changing dynamic between academia and professional staff, ensuring everyone is working towards common goals. • Engagement – in the university, industry and broader communities; engaging with the university community, including professional staff, students, and the broader community in a more impactful way, as well as public and private industry



WORKFORCE STRUCTURE

Stakeholders identified a shift in the types of roles that may be required to deliver higher education in Australia in 10-15 years' time, given the environmental factors described. Role design featured heavily in survey responses, underpinning three of the top five likely changes required of the workforce.

Table 4: Workforce structure options

Options
Redesign of existing roles: due to changes in future operating models, in part driven by historical (and potential future) constraints on research funding: • A move away from the 40/40/20 workload allocation model, giving academics the scope to flex roles as required and desired (i.e. some may focus exclusively on teaching and learning, to the exclusion of research, or other permutations). This may be implemented to compliment a requirement for increased industry engagement, greater research productivity, enhanced digital acumen, best practice andragogy, and philanthropic endeavours • There may be a change in delineation between academic and professional roles. For example, those low-skilled academic tasks that academics are currently undertaking the professional could take on in the future, and conversely additional internal and administrative tasks academics could take on • An increase in flexibility of the timing of working hours of academic staff, in alignment with growing 24/7 availability expectations, potential move to three trimesters, and online campus presence • Greater use of specialised casual employee roles, particularly to reflect demand for industry and subject matter experience
Design new roles: increased expectation that universities of the future will operate in a collaborative, digitally enabled environment may require: • Industry liaison roles (i.e. facilitation between university and public and private industry to broker relationships for sharing talent and collaborating on research and curriculum) • Academics roles designed for practitioners with experience from public and private industries • Technologists and education designers who are able to optimise the online, blended (i.e. online and on-campus) and on-campus experience for students and staff

WORKFORCE ENGAGEMENT

The way in which universities engage and manage staff through the employee lifecycle will need to shift, in response to changes in strategic direction and to fit modifications to workforce structure and capability.

Table 5: Workforce engagement options

Options
Professional development: investment in continuous development of technical and managerial skills will be required to ensure workforce capability meets demand, particularly in alignment with the future capability required (i.e. skills, mindsets and behaviours). Universities will need to consider effective delivery models in the future, and may consider different options for co-investment in learning and development
Career path: If the workforce is to engage a greater diversity of role types, with a greater diversity of backgrounds and focus, the mechanisms to advance and progress careers must be reconsidered: • Considering the appropriateness of existing promotion and tenure requirements, in light of greater specialisation and diversity of academics (e.g. practitioners) • Career coherence for casual or contractor workforce (particularly those that oscillate between industry and higher education)
Performance management and reward: frameworks should align individual accountabilities to organisational priorities, to support a collaborative, outcomes-focused university culture, but also ensure that academics and other staff engaged in new roles and ways of working are not disadvantaged. This increased clarity of performance expectation should extend to casual staff to ensure quality of student experience is upheld across the workforce
Mobility: with increased regional presence and global collaboration, mobility of the local workforce and engagement of a global workforce (e.g. through online platforms) are increasingly possible and needed
Diversity of contracts: contracting and part time models of engagement that enable staff to easily enter and exit the workforce for varied periods of time can alter the cost base but also create access to deep expertise (e.g. engaging a Nobel laureate for a course or a single lecture). The role of casuals in the workforce will likely be subject of continuous review – in some cases long term casual roles (we heard examples of some roles on rolling annual contracts for ten years or more) could be transitioned to permanent over time, and in some cases an increase in the casual workforce may be appropriate. The NTEU's view that a sustained research headcount is needed over the following decades, but that many researchers are in insecure jobs
Academic pipeline: in a faster, more responsive university where industry practice is valued, traditional academic pre-service (e.g. the decade required to prepare an individual for an academic career [112]) risks becoming less relevant. Universities may change the role requirements of academics and will begin to consider where the PhD is necessary (noting the current requirement for PhDs, or equivalent, teaching Masters and above students), and what might be suitable profiles for the academic of the future

[112] Coates, H., and Goedegebuure, L. Recasting the academic institution workforce: why the attractiveness of the academic profession needs to be increased and eight possible strategies for how to go about this from an Australian perspective. LH Martin Institute (2012).

NOT ALL UNIVERSITIES WILL NEED TO RESPOND IN THE SAME WAY

Consistent with a range of sector stakeholder discussions, we believe that greater diversity in the sector is likely, driven in large part by the extent to which Australian universities differentiate their value propositions and realise competitive advantage. This will be shaped by how they respond to and engage with the external drivers of change. We believe these strategic choices are critical to determining the workforce levers each university is likely to pull in order to develop their workforce strategies. Thus we do not believe there is a "one size fits all" approach to workforce reform in the sector. The individual strengths of each university will also influence the approach taken to these strategic levers.

To illustrate this point, we have presented a hypothetical university in Figure 4, showing the reforms such a university may need to undertake to respond to the drivers of change described in previous sections.

There are many possible permutations of university response. A university may also choose to respond in different ways across different schools and departments. Crucially, however, we believe every university will need to implement major change in the areas of:

- Leadership development
- Redesign of existing roles
- Changes to skills requirements
- Redesign of performance management and reward, and
- Professional development.

We acknowledge that the sector has been addressing these to varying degrees. In a sector that has traditionally valued academic autonomy, there has been some cultural resistance to adopting elements of contemporary management practice. However, we see continued improvement in these areas, in alignment with strategic imperatives, as critical for all universities if they are to meet the future challenges facing the sector.

Figure 4: Workforce interventions – An example university

Strategic focus of the example university

- Needs to actively differentiate through its response to external drivers or change.
- Focuses on delivering practical and employable skills to students through key industry partnerships and evolving curriculum offering.
- Fosters a culture of continuous change and advancement, supported by an agile workforce.
- Embraces the new opportunities for teaching delivery to access a wider audience through digitisation by making several post-graduate programs available in blended and pure online settings.

Results in reforms to

WORKFORCE CAPABILITY

Leadership
- Recruits new leaders with strong backgrounds in leading change from outside of the sector

Skills
- Invests in developing the analytical capability of the professional workforce to better leverage data to drive insights into operational improvement

Experience
- Sets objective for 10% of its leadership and academic workforce to have industry experience in three years
- Supports this aspiration through hiring, secondments and flexible working practices

Behaviours
- Hardwires values of collaboration, agility and innovation into the employee lifecycle to ensure adoption into actions and decisions

WORKFORCE ENGAGEMENT

Diversity of employment contracts
- Introduces contract lecturers for face-to-face and online courses to allow them to maintain roles in industry
- Introduces flexible working arrangements to allow leave of absence to pursue industry opportunities
- Redevelops all academic contracts to support 'generalist' roles

Performance and reward
- Implements performance management frameworks across all academic roles, including casual staff

Mobility
- Facilitates all courses in a flexible, channel agnostic manner with some content delivered by global experts
- Maintains partnerships and secondment programs with international universities

Career path
- Introduces secondments to and from industry partners, to develop business acumen, and encourage collaboration and different career paths
- Creates hiring and promotion policies that recognise industry experience
- Formalises a career path for high potential casuals to transition to permanent roles

Development
- Formalises learning and development to support capability aspirations, with a strong initial focus on professional staff development

Academic pipeline
- Sources new academic roles from both traditional pre-service backgrounds and industry experts in equal measure
- Develops 'equivalence' criteria to map industry experience into academic roles

WORKFORCE STRUCTURE

Redesign of existing roles
- In support of a more agile workforce, redesigns academic roles to reflect a consistent, generic set of responsibilities, with actual responsibilities changing year to year, depending on demand (e.g. moving between blended teaching/ research and pure research roles)
- Role expectations include working a full day outside the standard university working hours, on an as needs basis

Design of new roles
- Creates new roles to initiate and maintain industry partnerships both embedded in industry and the university
- Invests in a new digital and student experience team to analyse and design for future student demands
- Some of these roles are embedded directly within industry, and some are onsite at the university

IMPLEMENTATION

ROADMAP FOR IMPLEMENTATION

In line with our view that the forces of the externals drivers of change are such that 'now is the time' for change, we have developed a roadmap to identify areas of focus for reconceptualising the workforce into a logical sequencing pattern for our fictitious example university of the future, in alignment with its future state value propositions.

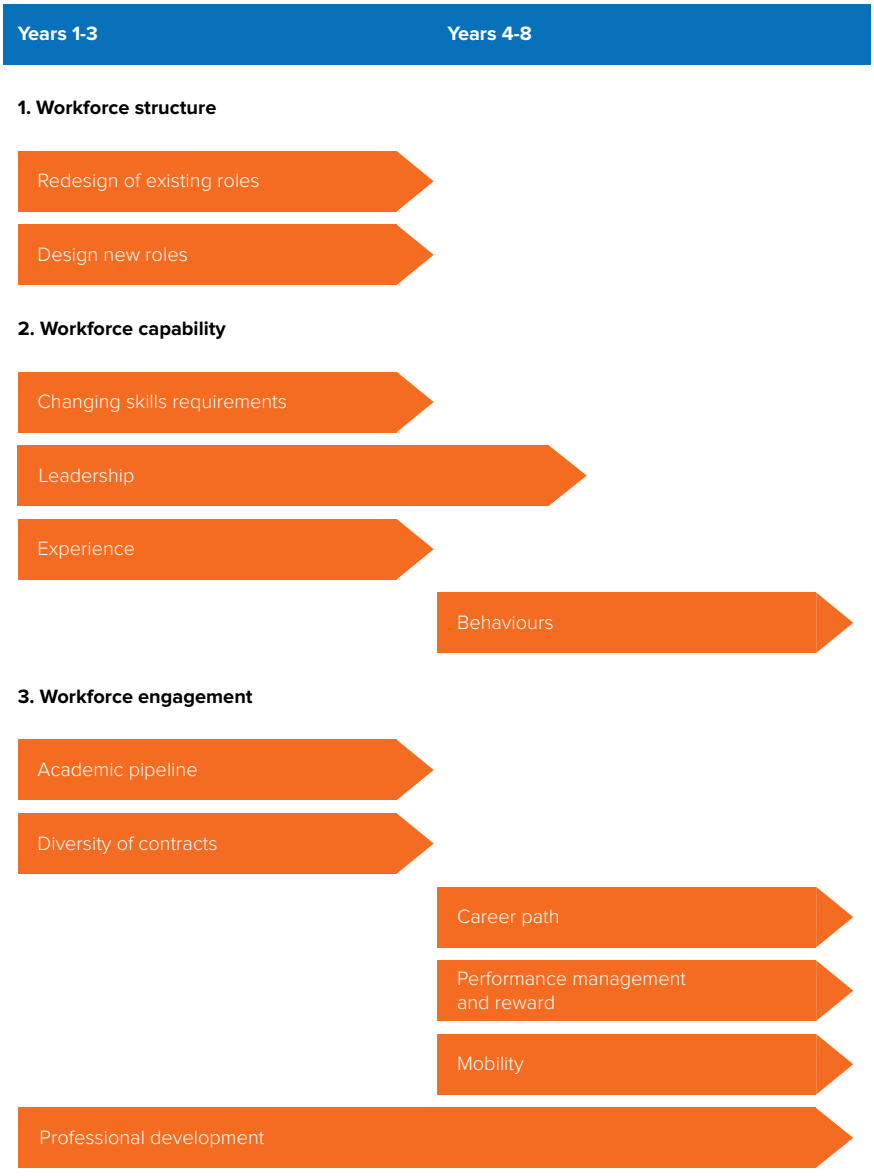
The indicative timeline in Figure 5 has been chosen in line with the workforce strategy defined in Figure 4 and relative priorities given its strategic direction. Further, given the historically change resistant nature of the university sector within Australia, we have outlined that a number of the interventions should commence in the near future in order to meet the demands of the future. This position resonates with the belief that preparation and commencement of graduated change needs to occur now in order to avoid wholesale reactionary change at a later date. We believe that all interventions suggested throughout this report are required within the next eight years, to ensure universities are well placed to respond to the challenges of the next 10-15 years.

In developing this roadmap, an emphasis has been placed on those opportunities identified as being priority areas of change to deliver the greatest benefit, while also recognising the dependant relationship between them. For example, career paths are best developed once role design is complete, to prevent iterations of the former. University context and existing workforce practices will influence actual sequencing.

For some of the areas of opportunity, the full benefits are expected to vest during the initial stages of the activities, but it is expected that for some universities, benefits will begin to manifest during the later stages of the evolution activities.

We believe that each university will respond to the external drivers of change in different ways. We expect universities to determine their own roadmaps in accordance with their own requirements and ambitions.

Figure 5: Workforce implementation roadmap - An example university



ENABLERS FOR IMPLEMENTATION

Our perspective on implementing change is informed by discussions with both local and international university leaders who have introduced some of the workforce reforms described above, and our own experience in managing change in the sector. Through our consultations, three key themes emerged as the hurdles university leaders will need to overcome as they embark on implementation of these workforce reforms:

- **Traditional and change averse culture –** university cultures have withstood the test of time, supported by the high degree of academic freedom inherent in the sector. However, a number of university leaders told us that cultural limitations are one of the most significant barriers to responding to, and anticipating, changes impacting the sector, to the detriment of the future competitiveness of Australian universities. In some respects, many in the sector are comfortable and do not believe that a burning platform exists which necessitates change. Student union representatives also supported the view that a top heavy governance culture is detrimental to innovation in teaching and research.
- **Industrial limitations –** while commentary was mixed, the majority of university leaders indicated that existing enterprise agreements placed constraints on universities' ability to properly manage workforces now and in the future, commenting that enterprise agreements (EAs) tend to "limit our flexibility and 'protect' our staff from change, no matter how inevitable it may be" and "limit our ability to articulate and enforce performance expectations." Observations were also made as to the protracted length of any change process, often placing the Australian industrial environment at odds with global practices.[113]
- **Lack of alignment between university and people priorities –** the planning and management of the workforce was often seen to be incongruous with or unlinked to the strategic objectives of the university. This was acknowledged as generally attributable to the cultural and industrial constraints placed on university operations, but there was an opportunity for people management to take more of a "seat at the table" as a strategic enabler for universities.

We appreciate workforce change is not a simple task, and as one international Vice-Chancellor commented, those universities that have been able to effect significant workforce transformation in an industrial environment required a clear mandate linked to the immediate survival of the institution to achieve the necessary reforms.

In order for universities to effect change in the structure, capability and engagement of the workforce, and overcome the historical limitations to change, a number of enablers are required, as preconditions to success:

Leadership and culture

- **Future-focused leaders making long term, clear strategic choices** to achieve a shared vision that is consistently and transparently communicated within the bounds of the governance framework of the institution. This is the alignment point for all systems and processes to ensure that critical behaviours, performance and roles are acknowledged in a differentiated manner. As one university leader pointed out, this is particularly poignant for those in teaching only roles, to ensure they feel job security and that "they do not feel like they are in the firing line" when they have not engaged in research for some time.
- **Adoption of a continuous improvement culture** by which the understanding is that the sector will be in a constant state of change. As one Vice Chancellor stated "Our challenge is to embrace change, not overcome it. Change will not pass." A future focused and change able culture is needed to ensure ongoing competitiveness, renewal and improvement of student experience, university reputation and the retention of talented staff.
- **An employee value proposition that** attracts and retains the right workforce to achieve the university's strategic objectives. As previously discussed, our survey indicated only 37% of university leaders either agreed or strongly agreed that they believe their employee value proposition is sufficient to compete for talent on a global scale (with only 5% strongly agreeing).[114]

[113] PwC, Higher Education Workforce of the Future survey, 2015.
[114] PwC, Higher Education Workforce of the Future survey, 2015.

HR and management capability

- **Investment in effective strategic workforce planning,** linked to strategic intent, to be able to communicate to stakeholders what the university is working toward. In our survey, workforce planning was listed amongst the top critical areas that universities will need to intervene in order to have a workforce that is properly equipped to meet the future needs of the university. This is consistent with the perspective of the NTEU, who believe that a lack of workforce planning in universities is evident and that changes to workforce are often described as reactions to changes in government funding, rather than an alignment to long term strategic plans.
- **Investment in management capability** to optimise the flexibilities within the current and future bounds of industrial agreements. There is the opportunity for management to build business acumen and capability to ensure they have the ability to manage the workforce effectively.

Change management and union engagement

- **Effective change management,** including transparency for the future direction of the university, communication and behaviours that comes from the top and are instilled in every layer of the workforce to ensure that "all staff are taken on the journey." Instilling this vision in every layer of the workforce will create a cohort of staff that "benefit from disruption and not be victims of it" a mindset thought to be crucial by a number of university leaders in dealing with the changes faced by universities in the next 10-15 years
- **Collaborative sector-level engagement with unions,** to ensure industrial instruments provide sufficient flexibility to support the longer term sustainability of universities in Australia, in addition to individual university engagement with unions on enterprise agreement negotiations specific to each university. As one Vice Chancellor reflected, "If the union worked with us, we'd be powerful. Otherwise it drives students overseas."

CONCLUSION

Over the past decade, the higher education sector has faced many changes – so much so that in our experience many in the sector express the sentiment that they are suffering from change fatigue; they want a break, and to be left alone to get back to their business.

But all the available evidence, and the view of those in senior university leadership roles, is that change will only accelerate over the coming 10-15 years. Throughout our extensive review of existing research and from engaging with over 300 stakeholders across the sector through various means, we heard that the next 15 years will be marked by fundamental changes to what and how the sector produces.

We've identified that challenges are now arising on many fronts: financial pressures and the erosion of public finances; unprecedented competition and new challengers; globalisation of competition for students, the workforce and funding; questions about the relevance and quality of higher education; changing demographics of student populations; and advances in information and communication technologies. Coupling this with the fact that employers told us that graduates are meeting fewer of their demands than previous generations, we can only opine that change is needed, and needed now.

Should the sector not undertake this change now, we believe the challenges identified throughout this report will continue to accelerate, putting more pressure on both the higher education sector and its workforce, and also Australia's future workforce and economic prosperity.

Conversely, the successful implementation of change will lead to increased value for students; increased quality of research in line with the Federal Government's innovation agenda; a better equipped and more highly skilled workforce, adaptable and agile for the changing nature of work; and increased social class mobility.

While change will be required of all universities, we believe the impact and application of this change at an institution level will be anything but uniform. There is no 'one size fits all' answer. Our expectation is that each university will have a unique response to these external drivers of change as they seek to differentiate their value proposition in what will become an increasingly diverse market.

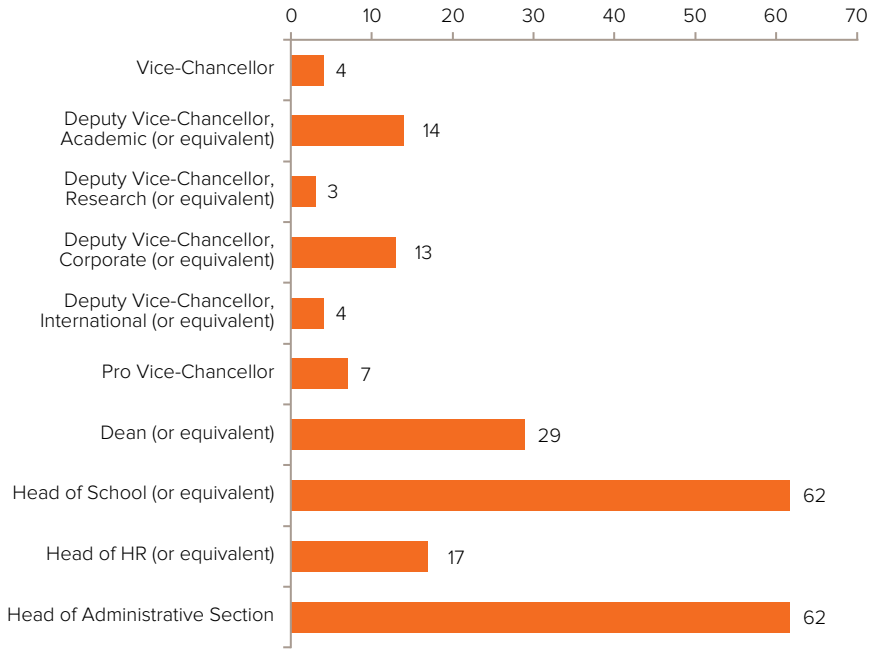
In anticipating this significant level of change across the higher education sector over the next 10 to 15 years, we can only see that the higher education workforce of the future will need to adapt to meet these demands, becoming more professionalised yet increasingly flexible and at the same time more specialised (in terms of the types of skills the workforce will need to possess).

Finally, in a historically change resistant sector, effecting this level of change may not be easy, and the impacts not realised immediately. However, to ensure Australia's higher education sector maintains relevance, is able to compete in an increasingly global market against as yet unknown competitors, and delivers on the needs of future society, change is needed.

APPENDIX A: SURVEY RESULTS

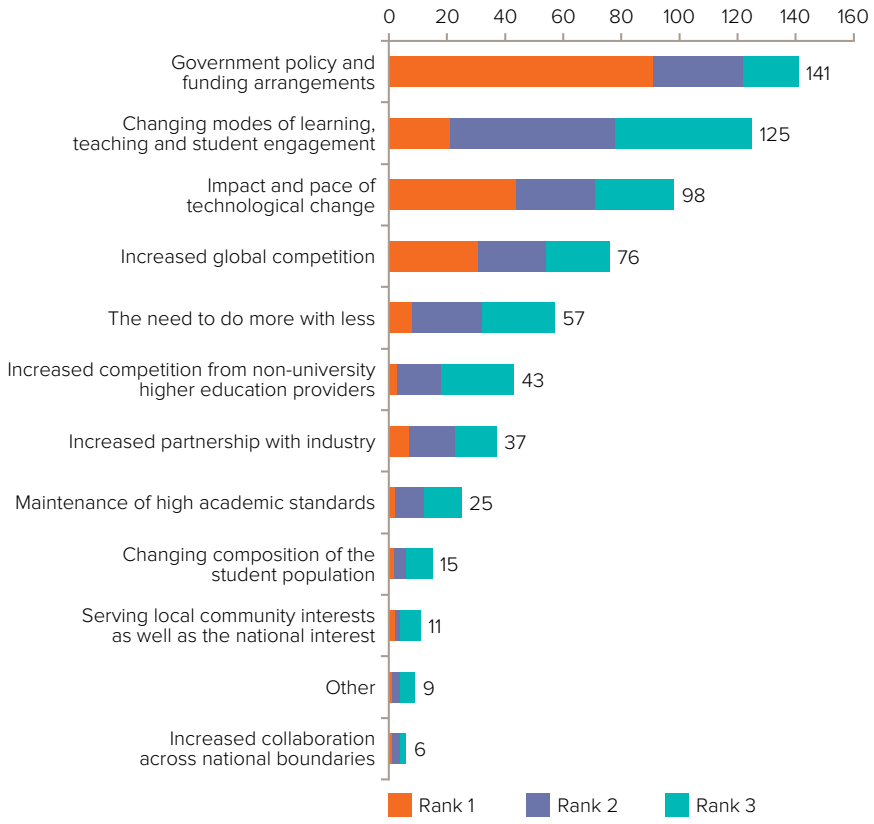
There were 215 individual respondents to the quantitative survey. University respondents included Vice-Chancellors, Deputy Vice-Chancellors (Academic), Deputy Vice-Chancellors (Research), Deputy Vice-Chancellors (Corporate), Deputy Vice-Chancellors (International), Pro Vice-Chancellors, Deans, Heads of School, Heads of HR and Heads of Administrative Section.

The following is a summary of the breakdown of respondents to the survey:

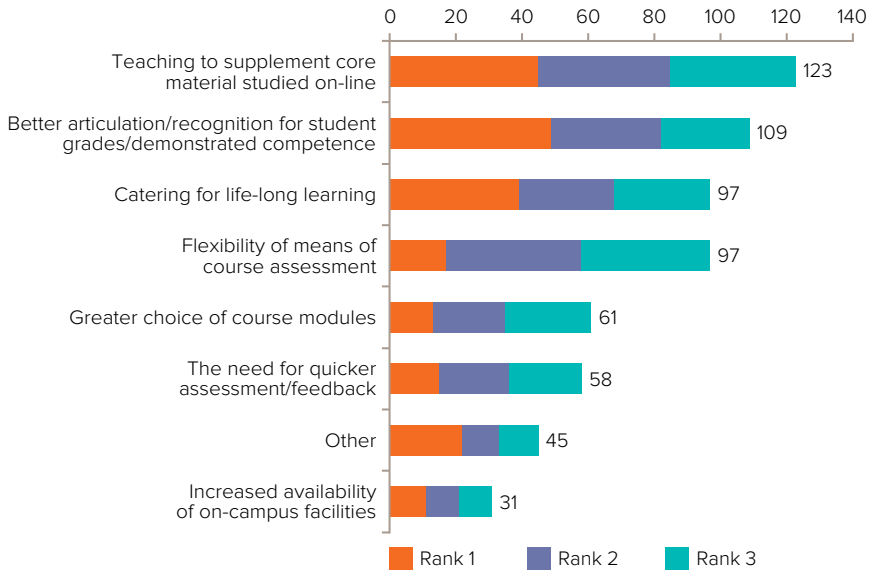


The following pages display a summary of results from the Higher Education Workforce of the Future management survey.

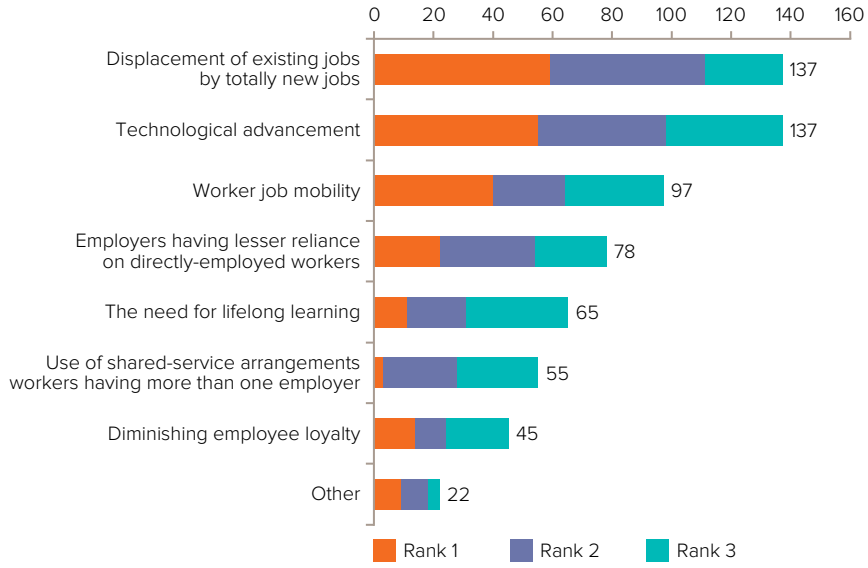
Q1 Please rank the top three (3) key environmental factors that you believe will have the most impact on your university over the next 10 to 15 years



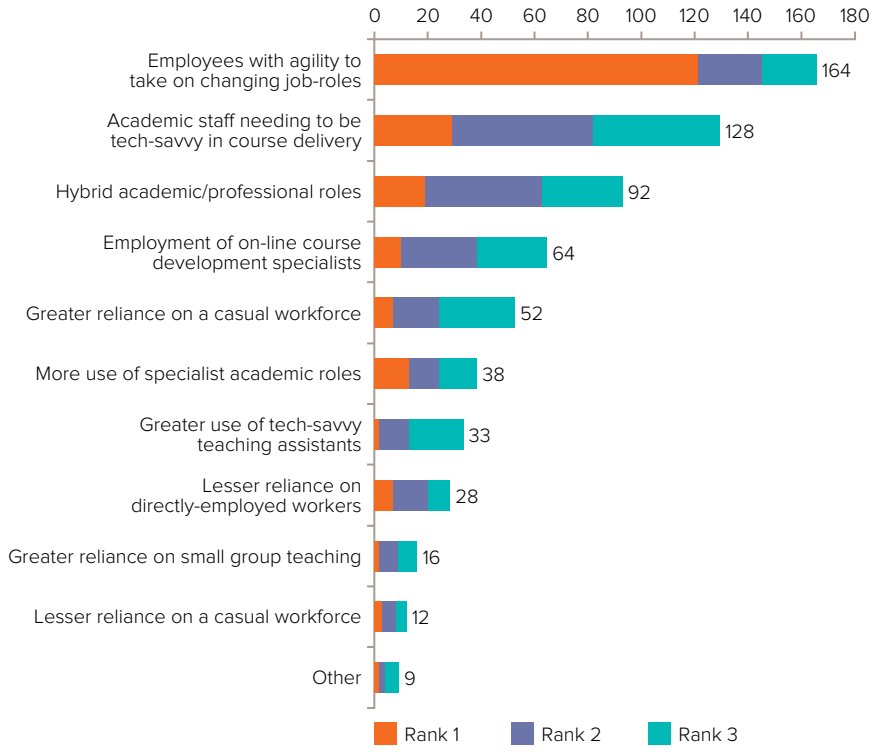
Q2 In relation to the changing needs and expectations of students, please rank the top three (3) key changes that you believe your university will need to make to the student experience over the next 10 to 15 years.



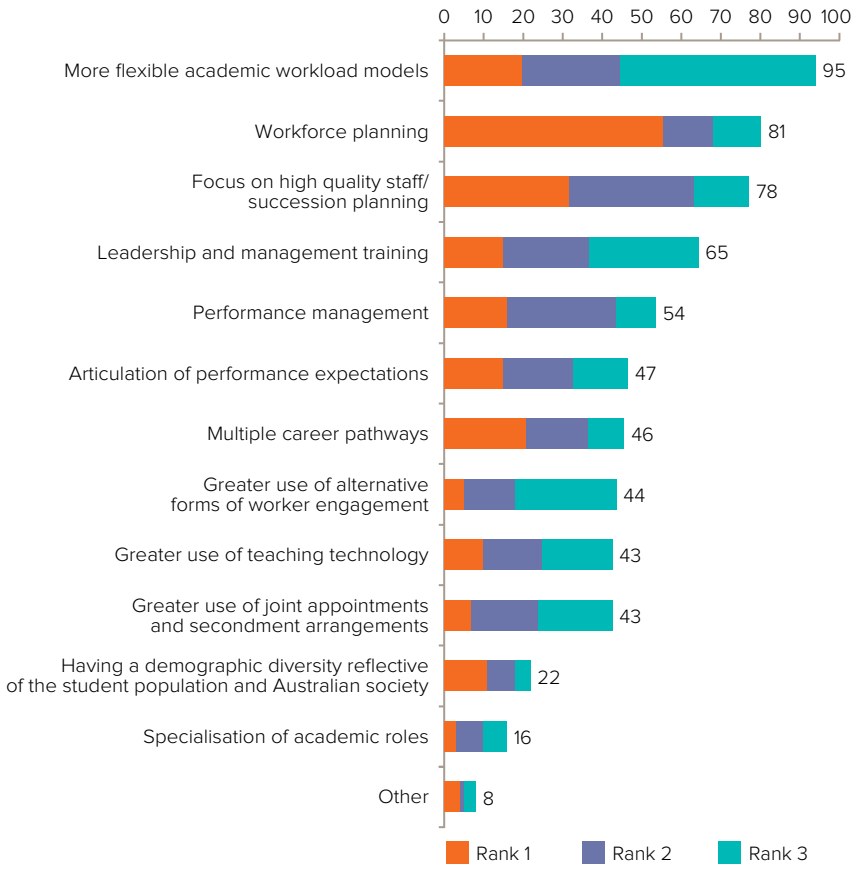
Q3 What are the key features of the changing nature of work in the workforce atlarge (i.e. including beyond higher education)?



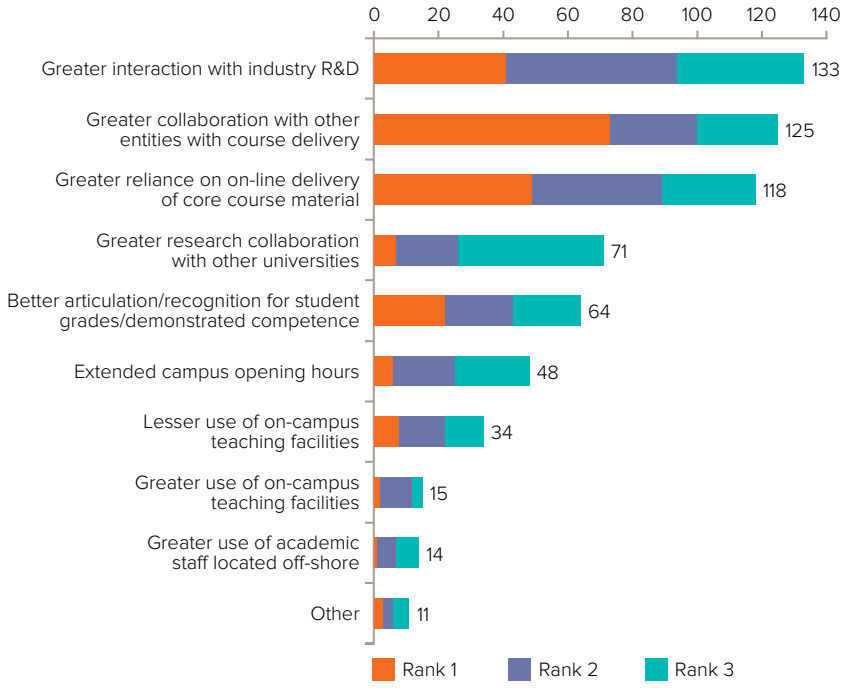
Q4 Given the environmental factors that are likely to impact universities over the next 10 to 15 years and the changing nature of work more generally, what changes are likely to be most necessary for the university workforce of the future?



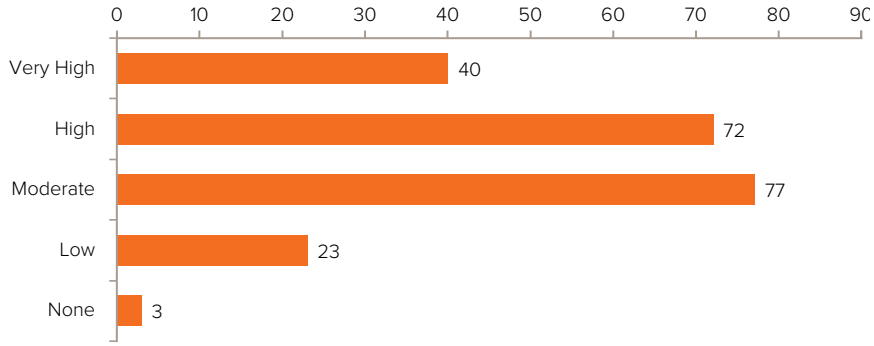
Q5 What do you see as the most critical areas where universities will need to intervene in order to have a workforce that is properly equipped to meet the needs of universities in 10 – 15 years' time?



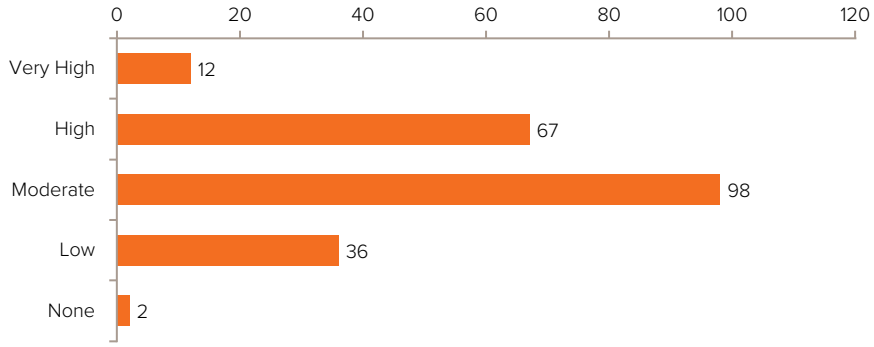
Q6 Given the likely future workforce needs of universities, what business models will universities need to give consideration to?



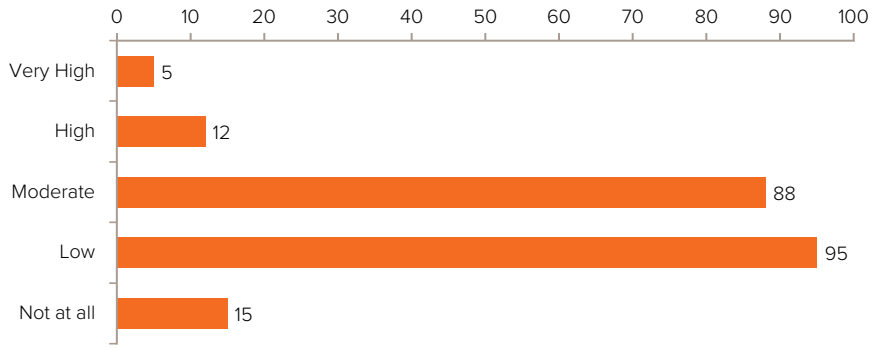
Q7 To what extent does your university's enterprise agreement(s) make it difficult for your university to have a high quality and highly-productive workforce?



Q8 To what extent do you believe your current employee value proposition will enable your university to attract and retain talent in an increasingly global market?



Q9 To what degree do you consider that the current manner of workforce regulation through the operation of your enterprise agreement(s) and HR policies is equipped to meet the future requirements of your university?



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