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Principles for equity in higher education performance funding

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Executive summary

Governments have long sought to assess and reward higher education institutions for their performance. Understanding the relative performance of institutions in teaching, retaining and graduating students would provide accountability for growing public funding, and would also be extremely helpful for prospective students. What constitutes performance though, and how should it be measured?

To answer these questions, it is helpful to refer to the national objectives of higher education. Enshrined in legislation, the goals of Australian higher education include quality, diversity, and the promotion of student equity. 'Performance' would ideally be defined by institutional success against these inter-related objectives, whether assessing teaching quality or the ability to develop thoughtful, productive and employable graduates.

The following report does not attempt to provide a prescriptive definition of performance nor of potential metrics. We do not advocate the introduction or otherwise of a broad performance funding model, and we do not outline any specific, preferred version of a model that might be introduced. Instead, we focus on why, and how, any effective performance model would incorporate principles of student equity. Drawing on Australian higher education history, evidence from the United States of America (US) and United Kingdom (UK), and an analysis of contemporary Australian data, we argue that there are three fundamental principles required to ensure an effective and equitable performance funding model.

The first principle is to integrate student equity as an explicit objective of the model. Performance funding objectives need to align with broader national objectives of higher education, including the policy and legislative commitment to student equity. Analysis of Australian data reveals variable institutional commitment to the goal of widening participation, highlighting the potential value of including equity of access as a performance objective in its own right. The need to integrate student equity would also be inherent in the design of metrics for student success, retention, completion, satisfaction, and outcomes.

Secondly, embedding equity principles in performance funding requires the rewarding of genuine performance rather than simply outcomes. Controlling for student equity and/or correlated factors is critical to isolate performance and determine the value added by each institution. Relatedly, there is a need to develop measures of 'learning gain' and better understanding of the institutional contribution to graduate outcomes. Such work has the potential to disrupt existing research-based rankings and to identify institutions that are high performing in teaching and supporting students, including those from equity groups. Our analysis of current Australian data, however, suggests that many existing potential metrics are either negatively or not correlated with each other. In addition, the public universities report relatively homogeneous student outcomes on most measures. Significant further work is required to distinguish institutional performance in areas of teaching, success, student satisfaction, and graduate outcomes.

Finally, equitable performance funding models would be student-centred. This approach would involve including students in the design and assessment of any proposed model, and ensuring inclusion of the student voice within the performance metrics themselves. Further, models would provide clear and transparent information that students could easily access and understand,

including for non-university higher education institutions. Indeed, our analysis suggests that non-universities include both the highest and lowest performers on many potential measures, but prospective students currently lack much of this information. Unless models are explicitly student-centred, performance funding could exacerbate inequity, partly by providing information that is accessible only to the most privileged students.

An equitable performance funding model would also need to observe broader established principles of good practice. Though some of these principles are not explicitly related to equity, it is important to note the need for:

- efficiency, with limited transaction and implementation costs;
- promotion of a developmental rather than punitive approach, which rewards institutions for improvement over time;
- strong accountability, consistency, and stability, to enable long-term planning and to avoid perverse incentives and ‘gaming’ of the metrics;
- expansion of institutional capacity to assist universities to analyse and improve their performance;
- broad stakeholder engagement in design and implementation;
- support of institutional diversity of missions; and
- respect of provider autonomy, with prescribed uses of funding in place only when justified by strong policy reasons.

We have not addressed these principles in detail, but they remain central to the implementation of an effective and therefore equitable performance funding model.

List of abbreviations

ABS	Australian Bureau of Statistics
ARC	Australian Research Council
ARWU	Academic Rankings of World Universities
ATAR	Australian Tertiary Admissions Rank
ATN	Australian Technology Network of Universities
ATSI	Aboriginal and/or Torres Strait Islander
CGS	Commonwealth Grant Scheme
CLA	Collegiate Learning Assessment
CPI	Consumer Price Index
CQAHE	Committee for Quality Assurance in Higher Education
CSP	Commonwealth Supported Place
DE	Distance Education
DEET	Department of Employment, Education and Training
DEEWR	Department of Education, Employment and Workplace Relations
DEST	Department of Education, Science and Training
DET	Department of Education and Training
DLHE	Destination of Leavers from Higher Education
DSP	Disability Support Program
EFTSL	Equivalent full-time student load
Go8	Group of Eight
GOS	Graduate Outlook Survey
GOS-L	Graduate Outlook Survey - Longitudinal
HEFCE	Higher Education Funding Council for England
HEIMS	Higher Education Information Management System
HELP	Higher Education Loan Program
HEPPP	Higher Education Participation and Partnerships Program
HESA	Higher Education Statistics Agency
HESA (2003)	Higher Education Support Act (2003)
HESP	Higher Education Standards Panel
IRU	Innovative Research Universities
ISSP	Indigenous Student Success Program
LEO	Longitudinal Educational Outcomes
LTPF	Learning and Teaching Performance Fund
MSI	Minority Serving Institution
NESB	Non-English Speaking Background
NHMRC	National Health and Medical Research Council
NSS	National Student Survey

NUHEI	Non-university higher education institution
OfS	Office for Students
QILT	Quality Indicators of Learning and Teaching
QS	Quacquarelli Symonds World University Rankings
RBG	Research Block Grants
REF	Research Excellence Framework
RSP	Research Support Program
RTP	Research Training Program
RUN	Regional Universities Network
TAFE	Technical and Further Education
TEC	New Zealand Tertiary Education Commission
TEF	Teaching Excellence and Student Outcomes Framework
TEQSA	Tertiary Education Quality and Standards Agency
THE	Times Higher Education World University Rankings
The SES	Student Experience Survey
UES	University Experience Survey
VET	Vocational Education and Training
WINTA	Women in Non-Traditional Areas

Recommendations

1) Integrate student equity as an explicit objective of the performance funding model

Align performance funding objectives with national higher education objectives, which include an explicit commitment to student equity and diversity. This commitment could include adopting equity of access as a performance objective in its own right.

2) Reward performance rather than outcomes

Control for student equity and/or correlated factors to distinguish institutional performance from outcomes, and to protect the objective of widening participation. Relatedly, develop measures of 'learning gain' and other indicators that reflect the value added by institutions.

3) Establish a student-centred performance funding model

Include students in the model design, include the student voice as a metric, and enable clear and transparent information that students can easily access and understand, including for non-university higher education institutions.

4) Ensure consistency with broader principles of effective performance funding

Broad principles of effectiveness include the need to:

- Develop model efficiency, with limited transactional and administrative costs;
- Promote a developmental rather than punitive approach, which rewards institutions for improvement over time;
- Ensure strong accountability, consistency, and stability, to enable long-term planning and to avoid perverse incentives and 'gaming' of the metrics;
- Build institutional capacity to assist universities to analyse and improve their performance;
- Include broad stakeholder engagement in design and implementation;
- Support institutional diversity of missions; and
- Respect provider autonomy, with prescribed uses of funding in place only where there are strong policy justifications.

Report structure

We begin this report by defining and clarifying performance funding, with an initial analysis of potential objectives, metrics, and models. Under any objectives adopted, we highlight a primary challenge of distinguishing actual institutional performance from broader outcomes that may simply reflect student inputs or exogenous factors. Subsequently we provide background to the higher education policy environment in Australia, highlighting growing calls for institutional accountability under an expanding system.

Our analysis then turns to the Australian context, and the historical development of various performance funding models. In particular, we explore early efforts to incentivise performance under the Dawkins reforms, and the subsequent introduction of a Learning and Teaching Performance Fund. As its name suggests, that fund was designed to reward institutions for teaching excellence, but results revealed the difficulties in distinguishing performance from outcomes, and highly selective universities dominated the funding allocations over the cycle of the program. Instability of metrics and objectives also contributed to sectoral confusion and difficulties in securing lasting, strategic change.

We then turn to international experience, focussing in particular on the United States of America (US) and United Kingdom (UK). Much of what is proposed in Australia is based on existing or inchoate overseas models, and it is critical that lessons from those models are learnt at design and implementation stages. The US includes a diversity of performance models that highlight potential risks, challenges, and opportunities for student equity. An inability or unwillingness to control effectively for student inputs has led many American performance models to reward increased selectivity of admissions, contrary to objectives of diverse and equitable access. Other risks observed include the tendency of some models to drive institutional homogeneity of missions, and to reduce emphasis on educational priorities perceived to be important but unmeasured or immeasurable. Conversely, a smaller number of US models have actually resulted in an increase to student equity and diversity, primarily through explicit weighting of some student inputs.

In the UK, the Teaching Excellence and Student Outcomes Framework (TEF) is at a midpoint in development. The TEF follows the earlier development of the Research Excellence Framework and aims to reward excellence in teaching and learning, and in promoting positive student outcomes. Metrics have been designed to enable commensurability and to protect equitable access. Diversity of mission is also sought, partly through the inclusion of a fifteen-page context statement by which institutions can highlight their particular strengths and contexts. These statements are included in the assessment of institutions, which itself is undertaken by an independent panel following a detailed process. Split metrics allow assessors to control for the characteristics of students, and student satisfaction results are also included as proxies for teaching quality.

Both the US and UK have struggled to isolate the value added by institutions, and therefore to distinguish performance from pure outcomes. Attempts to measure learning gain are being pursued in both contexts, including through the Collegiate Learning Assessment tool in the US and pilot programs in the UK. Most measures, however, remain proxies at best. Nevertheless, performance

funding models are already disrupting traditional university rankings, which typically measure research intensity and outputs above other objectives such as equitable access. International evidence highlights the potential of new models to reward institutional performance in teaching and learning, and in supporting student equity, and the related potential of such models to inform the enrolment decisions of prospective students.

While many objectives and metrics are contested, some measures are clearly likely to be included in any broad model of Australian performance funding. Student success, retention, completion, and satisfaction are consistently used in international performance models and are already measured at institutional level. Graduate outcomes, including employment and postgraduate participation, are also widely used. We begin our analysis of Australian data by examining existing sectoral outcomes on these metrics. Australian public universities fare relatively well on most metrics, though there remains substantial variation among private universities and the small but growing number of non-university higher education institutions (NUHEIs). Results suggest a need to include NUHEIs within any overarching framework, but also that most public universities record relatively similar, and positive, outcomes. The relative homogeneity of the sector complicates attempts to isolate institutional performance, particularly when we explore the general relationships between different performance factors. There is some positive correlation, e.g. student success is correlated with retention and completion. However, many factors are either not correlated or negatively correlated, e.g. completions and graduate outcomes.

Complexity is further heightened when we examine the case of equity students in particular. Most equity students record slightly lower than average outcomes on traditional metrics, though these outcomes are often attributable to factors correlated with their equity group status, e.g. distance, part-time and mature age enrolments. In some cases, equity groups outperform students overall on some metrics but underperform on others. Data suggest a need to control for equity student inputs and/or factors correlated with equity status, but also the need for more detailed design work to improve the scope and accuracy of metrics. Involving students in the design of performance models is also central to ensuring the generation of useful, transparent, accessible information that drives choice.

Finally, we return to the original objectives of the Higher Education Support Act. Both diversity and equity in higher education are required to ensure social cohesion, economic growth, and the achievement of national objectives. The importance of equity is acknowledged in the preservation of six identified equity groups – with associated targets and funding – for more than 25 years under Australian governments of different political persuasion. Student diversity, moreover, can demonstrably contribute to improved student learning by enabling more complex and challenging discussions. Requiring both objectives to be met through specific performance metrics would be consistent with established principles, and would ensure a more equitable and diverse higher education system.

What is Performance Funding?

Across the Anglo-American world, higher education has historically been funded primarily on the basis of enrolments and prior-year funding levels (Hearn, 2015). In Australia, universities receive public funding (Commonwealth Grants Scheme) for each domestic student they enrol, and students themselves contribute funds through income-contingent loans (Higher Education Loan Program). Various other forms of funding exist to support specific groups such as low socio-economic status and Indigenous students (Higher Education Participation and Partnerships Program and the Indigenous Student Support Program); the costs of regional provision (regional loading fund); and the costs of research (e.g. block grants).

By contrast to recurrent grant funding, performance funding typically connects public funding directly and tightly to institutional outcomes (Burke & Minassians, 2003). Usually these outcomes are student-focussed and are designed to measure the effectiveness of institutions in supporting and graduating students. Rather than rewarding universities on the basis of enrolments or other inputs, funding is tied to indicators of student success, satisfaction, completions, graduate outcomes, or other related measures. The policy reflects the fact that students, universities, employers and governments all have a direct interest in the achievement, completion, and graduate outcomes of students.

Importantly, funding on the basis of performance is different from funding on the basis of outputs. Student outputs often reflect student inputs, leaving little clarity as to the actual performance or 'value-added' by an institution. For example, the Australian universities with the highest student retention rates are typically the universities that attract the most academically prepared students. Without further context, proposals to fund institutions according to their retention rates would simply reward the most selective institutions and encourage greater selectivity among others. Such a proposal would not specifically reward performance, and would also undermine the principles of equity and diversity enshrined in funding legislation and policy development. Understanding institutional context is therefore central to the task of ensuring accountability for public funds provided.

Similarly, funding by performance is not simply a matter of controlling for all identified input factors that may affect student outcomes. Ultimately, there is a normative element to any system. For example, it may be that the Government does not wish to compensate universities for enrolling online students through distance education (DE). While distance education is associated with higher rates of attrition, the Government may decide that this is simply a question of institutional choice and not a matter for public intervention. The metrics to be adopted will reflect a broader philosophy, which will be particularly important considering divergent data. For example, groups such as part-time and DE students currently perform well on graduate outcomes but poorly on success and retention (Harvey, 2017).

Types of performance funding vary in their incentive structures, metrics employed, extent and scope, and overall objectives. In the UK, there is a specific focus on teaching excellence and student outcomes, and assessment includes consideration of institutional context statements, along with student survey data and graduate outcome data. In the US, accountability has typically focussed on retention, completion, and graduate outcomes, and models have ranged from provision of small funding inducements to recurrent funding for institutions (Dougherty et al., 2016, p. 4). Growth in

performance funding has seen a proliferation of different forms of large-scale funding policies (Kelchen, 2018b). More sophisticated designs include those that manage to differentiate by sector, ensure outcomes for underrepresented students are prioritised, and assess performance over medium term periods rather than by annual movements in metrics (Snyder & Fox, 2016, p. 5). Systems such as Pennsylvania also include provision for both core and optional metrics, by which institutions can focus on areas of distinction/priority for assessment. In New Zealand, completions and progression have been central to Government proposals, with recent proposed reforms including more contextual analysis of student equity groups (TEC, 2018).

Consideration of student equity within performance funding is therefore complex. Many equity groups record lower retention and completion outcomes than other students, but these lower outcomes are often related to factors beyond institutional control and/or unrelated to their equity group status (Nous Group, 2018, pp. 17-18). A primary challenge is therefore to distinguish outcomes from performance, and in so doing to avoid worsening sectoral and institutional inequity. Distinguishing outcomes from performance is also necessary to prevent the stigmatisation of equity group students as 'under-performing', and to enable and promote institutional diversity of missions. If such distinctions can be managed effectively, performance-based funding has the potential to highlight universities with low commitment to student equity, and to recalibrate institutional rankings in closer alignment to the Higher Education Support Act objectives.

A related challenge arises over the instrumentalist view of 'performance' encapsulated in any over-reliance on graduate outcomes, such as employment or salaries, as defining successful outcomes. Graduate outcomes are strongly influenced by family factors, geography, and other variables independent of university performance (Bartik & Hershbein, 2018; Britton, Dearden, Shephard, & Vignoles, 2016). Metrics based solely on financial outcomes could distort subject choices and career pathways (Chapman & Dearden, 2017), indirectly disadvantaging equity group (and other) students who choose less financially rewarding careers, work in regional areas, or prioritise non-financial career outcomes. Employment outcomes are clearly important, but one challenge of modelling is to develop metrics that capture positive outcomes to students and societies beyond snapshot metrics of income and taxation.

Finally, it is worth noting the importance of performance metrics to institutional reputation, which itself has substantial indirect funding consequences. Bowen and others have argued that higher education institutions seek to maximise 'prestige' rather than profit (Bowen, 1980), and governments have sought to exploit this inclination with 'low-stakes accountability', where performance is documented through greater collection and communication of data (Kelchen, 2018b, p. 84). Australia, the UK and the US all possess government-funded, consumer-oriented websites which provide higher education performance data to prospective students. Relatedly, a large range of external rankings are published, such as the Academic Ranking of World Universities (ARWU) and the QS World University Rankings, and these rankings drive reputations and enrolments, particularly of international students (Marginson & Van der Wende, 2007). Whether or not they are linked to direct funding, the establishment of performance metrics can create strong incentives for institutions.

Australian Context

Performance appraisal in higher education has become a matter of increasing importance over the past twenty years or so throughout the developed world. The trend in Australia derives mainly from continuing pressures for expansion of higher education associated with general funding constraints. There has emerged a persistent and increasing call for improved efficiency and public accountability in all aspects of higher education.

Linke, DEET, and Performance Indicators Research Group (1991)

Public investment, student equity, and accountability are all closely linked within Australian higher education. This relationship has led to increasing emphasis on public accountability measures at specific points in the history of Australian higher education. The Linke report of 1991 (Linke et al., 1991) and subsequent development of the Martin Equity and General Performance Indicators (1994) coincided with the Dawkins reforms and expansion of the system (Croucher, Marginson, Norton, & Wells, 2013). The Learning and Teaching Performance Fund introduced in 2005 coincided with new Commonwealth investment following the release of *Backing Australia's Future* (Nelson, 2003). More recently, the surge in student demand arising from the Bradley reforms has imposed fiscal challenges and triggered concerns about system quality. In 2017 the then Minister for Education instructed the Higher Education Standards Panel to examine admissions practices and student success and retention as two high priority issues. In the 2017 Budget the Government also foreshadowed the introduction of performance funding.

The logic of Linke in 1991 remains, albeit with a system unforeseeable from this earlier vantage point. The demand-driven system, in which most domestic undergraduate places were uncapped, has resulted in domestic higher education student numbers increasing by well over a third (Norton, Cherastidtham, & Mackey, 2018b, p. 21). This rapid rise in domestic enrolments, alongside now discontinued indexation arrangements, pushed Australian Government expenditure on the Commonwealth Grant Scheme in real terms from about \$4.7 billion in 2008 to \$7.1 billion in 2017, a 43% increase (Norton et al., 2018b, p. 48). Taking into account other costs associated with higher education such as research grants, student loan costs, student income support, and a large amount of other smaller grants, the Commonwealth expenditure is nearly \$14 billion (Norton et al., 2018b, p. 46).

Despite changing contexts, cohorts, and commitments, public reforms since 1987 have all included student equity as a central concern. The national student equity framework established under 'A Fair Chance for All' identified six targeted equity groups (Martin, 2016): Indigenous students; non-English speaking background students (NESB); students with disabilities; Women studying in non-traditional areas (WINTA); students from regional and remote areas; and low socio-economic status (SES) students. The Government continues to report on the participation, success, and retention of these groups, and it is notable that the Bradley reforms created both an attainment target, as well as a participation target, for low SES students (Bradley, Noonan, Nugent, & Scales, 2008). Most student equity funding, however, has historically supported access and participation rather than outcomes. The Indigenous Student Support Program (ISSP) funding, for example, was until recently provided to

universities on the basis of enrolments or claims (Behrendt, Larkin, Griew, & Kelly, 2012, pp. 74-75). Current HEPPP funding also provides funding on the basis of enrolments, in this case the number of low SES students at each institution. The extant student equity framework, then, is limited by an over-reliance on access and participation data rather than broader consideration across the whole student life cycle, as well as by the exclusion of postgraduate students and non-university higher education institutions (NUHEIs) (Harvey, Burnheim, & Brett, 2016). As our subsequent analysis reveals, the largest apparent variations in 'performance' can be seen in the non-university sector.

Recent concerns about quality have primarily arisen following the introduction of the demand-driven system, under which most universities dramatically expanded their student enrolments. Part of the sectoral growth has included an increase in enrolments from relatively under-prepared students, e.g. those with low ATARs, and there remains a documented correlation between low ATARs and course discontinuation (Norton, Cherastidtham, & Mackey, 2018a). Attrition rates remain relatively stable, but differences exist across groups and institutions. The graduate wage premium is declining (Norton et al., 2018b) and several student groups record relatively poor completion rates and/or graduate outcomes. These trends, combined with the aforementioned growth in public funding of higher education, have created a push for greater accountability for student outcomes and institutional performance.

The drive to tie funding to performance is not, however, new to Australian higher education. In the following section we outline historic attempts to measure performance, including through teaching and learning metrics and inchoate attempts to measure student 'learning gain'. The major predecessor to current proposals was the Learning and Teaching Performance Fund, while substantial research monies have also consistently been allocated on the basis of competitive grant processes, most notably through the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). Competitive research grants do not cover the full cost of research (core research infrastructure for example). Additional funding in the form of Research Block Grants (RBG) of various forms have been part of the higher education landscape for decades (Croucher et al., 2013). Funding formulae and guidelines for research block grants have been refined and recalibrated on a regular basis to incentivise a range of policy objectives including: success in competitive grants; success in obtaining industry funding; publications; research quality; social impact; higher degree completions; and even equity (Watt, 2016).

In the domain of student equity, the Government has embedded performance funding within the Disability Support Program (Department of Education and Training, 2016c). However, the funds allocated for disability performance are very small in the context of university budgets, and the year to year fluctuations are also small (Brett, 2018, p. 22; Department of Education and Training, 2016b, 2018b).¹ Given this, it is unlikely that disability performance funding is driving significant changes in institutional approaches to disability.

¹ In 2016 Disability Support Program funding made up approximately 0.003% of university receipts, and the maximum difference in university performance allocations was \$8,000 between 2017 and 2018.

More recently, the Government has recalibrated Indigenous student support funding to reward universities that succeed not only in attracting Indigenous students but in ensuring success and completions (PM&C, 2018). The proportion of funds distributed on the basis of performance is difficult to calculate given the funding instrument includes ceilings and floors on funding based on earlier funding models. However, Pool B of the Indigenous Student Success Program allocates 60% of available funds on the basis of success and completion performance (PM&C, 2018, p. 10). Indigenous support funding is administered and reported through the Department of the Prime Minister and Cabinet rather than through the Department of Education and Training Determinations website, making it difficult to track funding allocations and variance.

The inclusion of a performance funding element to HEPPP has also been proposed, with designs for approximately ten per cent of HEPPP funding to be contingent on average success rates for low SES and Indigenous students (Australian Government, 2017, pp. 22-23). To date, changes to HEPPP are no longer on the legislative agenda after the bill was blocked in the Australian Senate and finally abandoned in late 2017. Performance funding has already thus been applied to student equity, but it is important that student equity is also applied to performance funding.

Governments in general are also promoting accountability through greater collection and communication of data (Kelchen, 2018b, p. 84), creating performance incentives that are reputational rather than directly financial. The Quality Indicators for Learning and Teaching (QILT) website contains comparative completion and outcomes data and follows a growing emphasis on providing transparent outcome data to inform student choice. The Australian Government has also begun collecting detailed data on the costs associated with higher education teaching and learning, and plans to publish such information alongside other metrics on the QILT website. According to the Government, this will “provide students with a better idea of how their fees are being spent” (Australian Government, 2017, p. 29).

Central to the success of QILT and the broader project of supporting informed choice is the inclusion of students themselves in model design and communication. We have previously highlighted the widespread inequity in access to information about higher education application processes and pathways (Harvey, Brett, et al., 2016). Low SES, regional and rural, and other equity group students are often disadvantaged by a narrower range of subjects from which to choose (compared with metropolitan and/or privileged schools), limited careers resources in schools and a lack of access to ‘hot’ knowledge. Comparative information on institutional performance may assist some students to make more informed higher education choices, but information must be transparent, clear, and widely accessible.

Performance funding in Australia and around the world

Australia

This section addresses three major performance funding regimes in recent Australian higher education history: the Quality Assurance Program from 1993-1995; the Learning and Teaching Performance Fund (LTPF) from 2005-2009; and the shift to enrolment targets and demand driven funding, alongside the Mission Based Compact performance policy, which was never fully implemented.

Dawkins Reforms, the Quality Assurance Program and the Committee for Quality Assurance in Higher Education (CQAHE)

Performance funding and other forms of quality assurance for university teaching have expanded since the so called 'Dawkins Revolution' beginning in 1987 (Dawkins, 1988, Part 3; Macintyre, Brett, & Croucher, 2017, p. 135). The Dawkins White Paper (Dawkins, 1988, p. 85), *Higher Education: A policy statement*, called for 'funding arrangements that take into account a range of output, quality and performance measures... including measures such as student satisfaction and completion rates, relative staffing levels and research publication and consultancy rates.' To formulate how a new system of performance measurement would operate, Dawkins commissioned a working group headed by Russell Linke to define a suite of indicators and test their feasibility (Macintyre et al., 2017).

The subsequent Quality Assurance Program of annual quality audits was run by the independent Committee for Quality Assurance in Higher Education (CQAHE) and began its first assessment in 1993 (Macintyre et al., 2017, p. 151). Universities would submit a portfolio ahead of a one-day visit by a panel, which then prepared a report that formed the basis of the CQAHE's funding recommendation. The first quality round examined the full range of university activity: higher education teaching, research, and community service, and subsequently ranked universities in six groups. The six universities in the highest group were large and well established, although The University of Sydney and Monash University were allocated to Group Two. The scheme was abandoned after the 1995 assessment. In the three years it operated, universities were awarded \$76.8 million in 1994, \$71.3 million in 1995, and \$50 million in 1996 (all figures in nominal terms).

For the less selective universities, many of which had only just been established or gone through disruptive amalgamations, this process proved to be both fruitless and damaging to their fragile reputations (Macintyre et al., 2017, pp. 152-153). The process was also thought to disadvantage universities with larger equity cohorts. In their book *No End of a Lesson*, Macintyre, Brett, and Croucher (2017, p. 154) argue the scheme led to adverse and unintended consequences:

It was meant to provide financial relief, but the distribution of monetary rewards turned into a competitive exercise, while the inclusion of performance evaluation led to rankings...the procedures adopted by the CQAHE, especially the generic observations made in its system-wide annual reports, had the opposite effect [to encouraging diversity]. Since all institutions aspired to the financial and reputational benefits of a positive assessment, they sought to conform to the Committee's commendations of best practice. As all were assessed for performance, the stronger universities with their inherited advantages were bound to do better.

The Learning and Teaching Performance Fund (LTPF)

The Learning and Teaching Performance Fund (LTPF) was proposed in 2003 to reward institutions ‘that best demonstrate excellence in learning and teaching’ (Nelson, 2003, p. 29). A major objective of the scheme was to create parity of esteem between the prestigious research activity undertaken in universities and the ‘poor relation’ of university teaching (Probert, 2015, p. 28).

The initial LTPF process involved two stages. The first stage determined whether institutions were eligible to be considered for funding. Universities had to demonstrate strategic commitment to learning and teaching, provide a current learning and teaching plan, evidence of systematic support for professional development in learning and teaching for sessional and full-time academic staff, probation and promotion practices and policies that included effectiveness as a teacher as a criterion, and systematic student evaluation of teaching that informs probation and promotion decisions for academic positions (Nelson, 2003, p. 29). The second stage measured university performance according to a set of quantitative indicators, along with a qualitative assessment by an expert panel, and then awarded additional funding based on measured performance (DEST, 2005a, p. 5).

Table 1: Indicators and weightings for the 2006 year of the LTPF

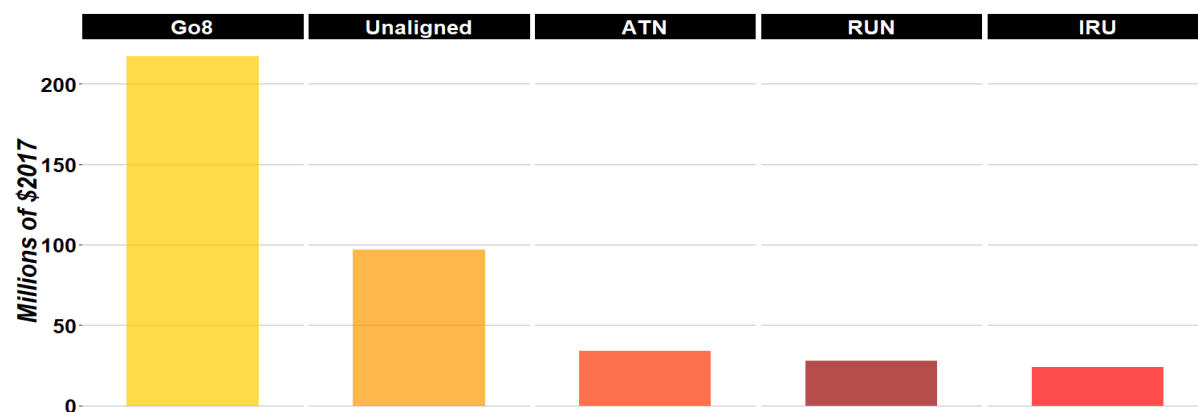
Indicator	Weighting
Student satisfaction	55% of total
CEQ Generic Skills	17.91%
CEQ Good Teaching	18.52%
CEQ Overall Satisfaction	18.90%
Outcomes	22% of total
GDS Full-time Employment	11.48%
GDS Further Full-time Study	10.29%
Success	23% of total
Student Attrition Inversion – Commence	10.65%
Student Progress – Commence	12.26%
Total	100%

Source: DEST (2005b)

The 2006 LTPF used seven indicators: progress rates; retention rates; graduate full-time employment; and graduate full-time and part-time study; students’ perceptions of the skills they have gained from their study; their opinions on the quality of the teaching; and their overall satisfaction with their course (DEST, 2005a, p. 10). The table above shows the weightings given in the 2006 LTPF round. Indicators were adjusted for input factors in an attempt to isolate the institutional effect on performance. The factors included in the adjustment included gender, age, non-English speaking background, Indigenous status, level of study, field of education, residency status, disability status, geolocation, socio-economic status based on educational and occupational factors as well as economic resources, first in family status, basis of admission, tertiary entrance rank, institution size, and local labour market conditions (DEST, 2005b).

Several changes were made in the 2007 round, including equal weighting applied to the seven indicators, as well as splitting institutional performance across the following four broad discipline groups: science, computing, engineering, architecture and agriculture; business, law and economics; humanities, arts and education; and health (Coaldrake & Stedman, 2016, p. 82). Further changes were made in 2008, with a large reduction in the number of different factors adjusted (Marks & Coates, 2007). In the final year of the LTPF, funding was allocated based on whether institutions had improved on their metrics from the previous year (Coaldrake & Stedman, 2016, p. 87).

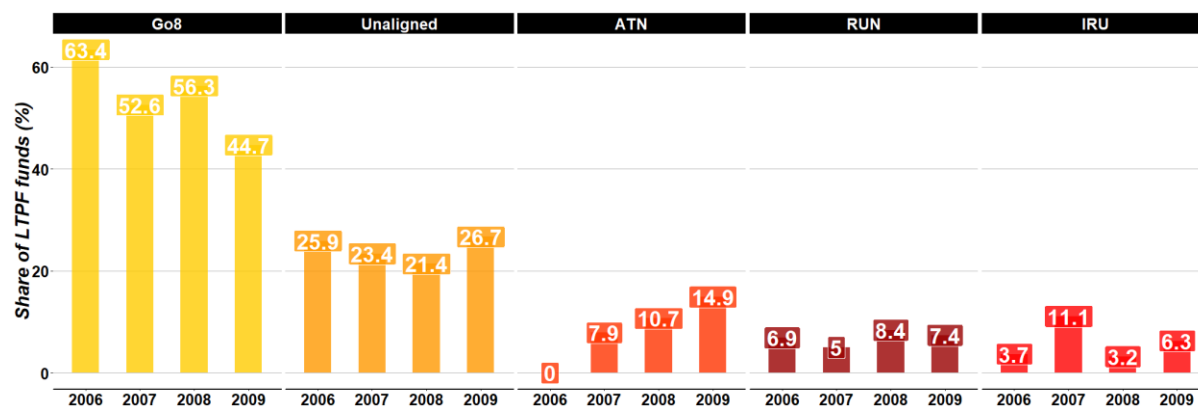
Figure 1: LTPF funds accumulated over the life of the scheme by university grouping



Source: DEEWR (2008, 2009a, 2011b); DEST (2007)

Notes: LTPF funding amounts have been converted to 2017 dollars using the ABS Consumer Price Index. University groupings correspond to the groupings outlined in Appendix A.

Figure 2: LTPF annual allocation shares by university grouping, 2006-2009



Source: DEEWR (2008, 2009a, 2011b); DEST (2007)

Notes: See figure 1.

Between 2006 and 2009 the LTPF awarded a total of \$363 million (in 2017 dollars) to institutions (Probert, 2015, p. 27).² As Figure 1 and Figure 2 show, the Group of Eight institutions with the most inherited prestige gained the majority of the LTPF funds. Calculated using 2017 dollars, over the life of the fund, the Group of Eight received over \$195 million, or 54% of the total funding. By contrast, the Innovative Research Universities (IRU) and Regional Universities Network (RUN) – comprised of institutions with large equity student cohorts - received under \$25 million (6%) each in 2017 dollars. Another unusual distributional consequence of the Fund was that the university with the greatest proportion of Indigenous students, Charles Darwin University, received no LTPF funds over the four years.

The Learning and Teaching Performance Fund received a mixed critical reaction. An official review of the LTPF concluded that, “It is reasonable to assume that between 2004 and 2007, changes to the indicators may have been influenced by improvements in university learning and teaching, possibly driven by the LTPF” (DEEWR report quoted in Coaldrake & Stedman, 2016, p. 89). Coaldrake and Stedman (2016, pp. 84-85) found this evaluation to be completely unjustified and were particularly unconvinced by the adjustment processes used:

“Regression analysis at the institutional level is a crude tool for disentangling the complex interacting relationships and variations involved in university teaching. At the aggregate university level a number of the influences that might bias the results could well average out, but students are not randomly assigned to universities and the structures of courses are not the same across all universities. Factors that are inconsistent in their effect at the national level can and do have an influence at the institutional level.”

Another criticism of the LTPF was that it was too often presented in the media in the form of rankings, and had reputational effects disproportionate to the scale of difference in the LTPF outcomes (Wheelahan, 2007).

Some commentators have also pointed to positive unintended outcomes. Probert (2015, p. 35) argues that the sheer size of the fund meant that no university chose to opt out, which, ‘gave leaders of teaching and learning internal leverage if they needed it’. The eligibility requirements for the first stage of the LTPF embedded lasting practices and processes within institutions that have far outlived their original context. Many of these LTPF requirements have become standard practice in the Australian higher education sector. As Probert (2015, p. 36) notes, “Every university now has a teaching and learning plan, employs some form of gathering regular student feedback on teaching, and gives teaching greater weight in promotion criteria. They all offer a range of professional development programs promoting effective teaching in higher education, and many now require new staff to participate in these”.

² The first round of the LTPF was conducted in 2005 for distribution of funds in 2006, and 14 institutions shared \$54.4 million in nominal terms. The second round took place in 2006 for distribution in 2007 and 30 institutions shared \$83 million (nominal). The third round took place in 2007 for distribution in 2008 and 23 institutions shared over \$83 million (nominal). The fourth round took place in 2008 for distribution in 2009 and over 32 institutions shared over \$73 million (nominal).

From a student equity perspective, the LTPF highlighted the challenge of distinguishing outcomes from performance, and the need to account for diverse student populations. While adjustments were made for geo-demographic characteristics, the fund remained dominated by the most selective institutions that enrolled relatively few equity group students. Universities that served regional, Indigenous, low SES and other under-represented students typically received very small proportions of funding, and there existed a strong correlation between selectivity of admissions and assessed performance. As we will see in the US context, accounting for student inputs requires substantial work and commitment. Without fully considering the context of the student cohorts enrolled, performance funds often replicate traditional research rankings and may reward selectivity and reputations rather than capturing the value added by institutions. On the upside, the LTPF also highlighted the benefits of institutions being compelled to listen closely to their students.

Demand driven funding and mission-based compacts

The election of a Labor Government in late 2007 and a subsequent review of Australian higher education by Denise Bradley and colleagues were the catalysts for the next major policy overhaul (Bradley et al., 2008). The Bradley Review recommended that funding be allocated according to student demand rather than the central allocation of places, and targets were recommended for 40 per cent of adults between 25 and 34 years of age to hold at least a bachelor level qualification by the year 2020, as well as 20 per cent of undergraduate enrolments in higher education to be students from low SES backgrounds by 2020. A further proposal was that a proportion of funds be allocated based on performance against specific targets for teaching and equity (Bradley et al., 2008, pp. xiii-xiv). The Government also established the Tertiary Education Quality and Standards Agency (TEQSA) with wide ranging regulatory power over higher education, which replaced the various state-based regulatory bodies (Norton & Cakitaki, 2016, p. 33).

In its response to the Bradley Review, the Government uncapped places, enabling universities to attract Commonwealth funding for unlimited undergraduate enrolments in most fields of education. The Government also committed to performance funding but established that it would work with the sector to develop a robust set of performance indicators (Commonwealth of Australia, 2009, p. 33). The mechanism chosen was a system of 'mission based compacts', which had already been signalled in a 2008 Budget Paper (Gillard, 2008). Under the proposal, each institution would enter into a mission-based compact with the Government, which included performance targets, and some funding would be contingent on meeting the agreed targets. An amount of \$94 million was available in 2011 as a facilitation payment for agreeing to the first year of institutional targets (DEEWR, 2011a), and from 2012, \$135 million would be committed annually to award to institutions that met their targets (DEEWR, 2009b, pp. 3-5).

In the process of designing a new performance funding regime, the Government set about creating new performance indicators, and recalibrating existing ones. A new survey was created to measure the student experience while at university, the University Experience Survey (UES), which was the precursor to the Student Experience Survey. The Government also committed to developing a 'learning gain' instrument modelled after the Collegiate Learning Assessment (CLA) in the US, that would be used to measure the value added by the university (DEEWR, 2009b). In parallel to the creation of new metrics was the development of a means to improve access and other interested stakeholders through a consumer-oriented website, *MyUniversity* (DEEWR, 2011a, p. 20). Some have

questioned the reach and effectiveness of *MyUniversity* (Norrie, 2012), but the exercise did show that, alongside demand driven funding, the Government hoped to use consumer behaviour to stimulate performance improvement throughout the sector. Later the original *MyUniversity* website was abandoned and replaced with a new website under the name of Quality Indicators in Learning and Teaching (QILT).

Ultimately, the new range of accountability reforms were undermined by mounting pressure on the Federal Government budget. With fewer than expected receipts coming in to treasury and competing spending demands such as needs-based school funding, the Government subsequently decided not to proceed with the reward funding for meeting student experience and quality of learning outcomes targets (Coaldrake & Stedman, 2016, p. 93; Probert, 2015, pp. 30-31). Development of the University Experience Survey was continued through to completion, but the work on the learning gain indicator was discontinued. Even though reward funding was no longer available, the exercise of composing mission-based compacts continued. Yet with no funding at stake, the process became little more than a perfunctory regulatory requirement (Croucher, 2015).

The performance, or reward target, funding component of compacts was short-lived and as such it is difficult to make claims about their impact. In 2012, when first introduced with only minor expectations of equity performance uplift in place, \$20 million was distributed. Two public universities were not in receipt of funds. The final year of the reward funding was in 2013 and marked a further uplift in performance expectations. In 2013, \$18 million was distributed and six public universities did not receive funds. Although the financial incentives were never significant, the drive to measure performance led to formative attempts to provide better information to prospective students and to capture the student voice through an extensive nationwide survey.

The historical experiences of Australia highlight the need to control for equity factors to avoid confusing institutional prestige with performance; the need for sectoral buy-in and institutional contribution to policy development; the need for clear messages and consistent long term policy settings to enable institutions to plan and adapt to new metrics; and the need to clarify purpose and ensure that metrics are consistent with that purpose. When designing performance frameworks, it is also important that policymakers take into account the capacity of institutions to improve their effectiveness and efficiency (Dougherty et al., 2016). Finally, history shows that performance funding has driven greater influence of the student voice, but also that more active engagement with students is required in order for published results to be legitimised and utilised to inform choice.

The United States of America

The United States (US) has one of the largest and most diverse higher education systems in the world. On a recent count, there were over 2,000 private non-profit and public baccalaureate colleges and universities, about 1,000 community colleges, and around 1,300 for-profit institutions, which have enjoyed strong growth over the last few decades (Holzer & Baum, 2017, p. 18). The federal system of government means that the states both formally, and in practice (in contrast to Australia for example), have primary responsibility for higher education policy, although the Federal Government contribution is substantial in many states through research and student aid funding, while many community colleges are funded primarily from local sources, e.g. property taxes. The Federal Government distributes large amounts of funding to students as aid grants, for example Pell Grants, as well as military and veterans aid (Holzer & Baum, 2017, p. 98), and other forms of support through the Federal Work Study program and the Guaranteed Student Loan program (Kelchen, 2018b).

Over time, performance conditions have been placed on the estimated \$140 billion Federal aid eligibility (Kelchen, 2018b, Chapter 3). Recent unpassed Federal legislation – the bill for the Promoting Real Opportunity, Success, and Prosperity through Education Reform (PROSPER) Act – proposes to attach more onerous performance conditions to the availability of student loans and grant funding (Kramer II & Marsicano, 2017). The states primarily distribute public funding to institutions, the majority of which now use performance funding to allocate additional, or a portion of recurrent, funding. According to a 2015 count, there were at least 34 states with higher education performance funding policies (Kelchen, 2018b, pp. 145-147).

The scale and complexity of US higher education provides many different entry points for students, but also results in a highly stratified system. Students from lower socio-economic and Black and Latinx (see Thorne, 2018) groups in American higher education are highly under-represented in four year and more academically selective institutions, and are much more likely to enrol at expensive for-profit institutions (Holzer & Baum, 2017, pp. 22-24). While this trend is partly due to lower levels of academic preparation among these groups (Holzer & Baum, 2017), high achieving students within these groups are also less likely to apply to elite institutions than their academic achievement would warrant (Hoxby & Avery, 2013). Under-represented students typically also record lower retention and completion rates (NSC Research Center, 2018). One of the primary risks, then, of performance funding regimes in the US is that they may lead to reduction in higher education access for minoritised groups, as institutions adopt more selective admissions policies to improve their outcomes and apparent performance.

Multiple analyses of performance funding regimes in the US have highlighted a decline in diversity of admissions following the introduction of funding by outcomes (Dougherty et al., 2016; Jones et al., 2017; Kelchen & Stedrak, 2016). Kevin Dougherty and colleagues (2016, pp. 174-175) conducted in-depth interviews with senior administrators at both 4-year and community colleges in states with performance funding policies in place, and found that the majority of interviewees identified restricted admissions as the main unintended impact. Similarly, a study in Indiana examined whether the presence of the performance funding increased either the number of graduates, selectivity, or

enrolment rates of minority and low-income students (Umbricht, Fernandez, & Ortagus, 2017). The researchers found that Indiana's performance funding policy led to decreases in overall admission rates for minoritised students compared with private providers in Indiana, and also public institutions in similar states (Umbricht et al., 2017, p. 664). Fewer students from racial and ethnic minorities were admitted, as well as students from low-income backgrounds. The researchers note that the effects of the performance funding policy may only be evident after 4-6 years, and so their findings may only reflect the short-term effect of performance funding (Umbricht et al., 2017, p. 659).

Another study examined the Texas community college sector and estimated the expected revenue from enrolling different student groups as a result of their performance funding schema (McKinney & Hagedorn, 2017). In the Texas community college model, 10 per cent of state funding is tied to performance metrics, including students completing developmental coursework, passing college level courses, completing 15 and 30 semester credit hours and key educational milestones such as earning a certificate or associate degree, or a four-year transfer. The performance funding regime is called the Student Success Points model, and colleges are awarded \$185 per success point. Analysis by McKinney & Hagedorn (2017, p.178) found that African Americans, older adults, part time students, and students assigned to the lowest levels of remedial coursework procure much less funding than their peers under the model. According to a similar study, between 2005 and 2015, minority serving institutions (MSIs) in states with performance funding policies on average lost significant funding per student compared to MSIs in states without performance funding, as well as non-MSIs in states with performance funding (Hillman & Corral, 2018). These results themselves need to be seen in a context where minority-serving institutions, including Historically Black Colleges and Universities (HBCUs) are often underfunded, with or without performance funding.

Nevertheless, while many studies suggest performance funding regimes have contributed to adverse equity outcomes, another strand of research reveals that student equity can be maintained and potentially even improved by providing premiums, or higher weightings, for equity group performance (Gándara & Rutherford, 2017; Kelchen, 2018a). Gándara and Rutherford (2017) sought to uncover whether premiums for equity groups in performance regimes have an effect on an institution's selectivity, or demographic profile. Examining changes within institutions between 1993 and 2014, the study compares states with premiums for equity groups in their performance funding regimes against states with no such premiums. The researchers found a significant positive effect of premiums on expanding the access of low socio-economic and Latinx students to higher education over time, though the same effect was not found for African-American students (Gándara & Rutherford, 2017). This gap may be because, as Jones and colleagues (2017, p. 23) find in another study, while some states explicitly address class-based stratification in their performance model, they are reluctant to tie equity goals to race. Another important factor in the effectiveness of premiums for improving equity access is the size of the premium. In Tennessee, for example, a small initial premium was substantially increased subsequently, and the higher premium did result in a widening of participation (Dougherty et al., 2016, p. 183).

What the US experience reveals is that 'performance' funding without context will measure outcomes alone, and will typically therefore disadvantage minoritised students and the institutions that serve them. However, with appropriate adjustments to consider student characteristics and

inputs, performance funding models can mitigate these negative tendencies, and potentially even lead to an increase in equity group access and participation. Effects of the models depend on the assumptions and principles underlying them. If a commitment to student equity and diversity is held as a central principle of higher education, then that commitment needs to be reflected in the design of performance funding models and consideration of the complex factors affecting retention and outcome data. Other findings from US research confirm the need for long term approaches, consideration of institutionally diverse missions, addressing institutional capacity to respond to performance policy, and understanding of different student cohorts (Dougherty et al., 2016; Snyder & Fox, 2016).

In addition to contextualising for student demographics, performance regimes need to establish the value added by institutions. This is an extremely complex task, with multiple factors of causation influencing the success, completion rates, and graduate outcomes of students. One of the more notable attempts to measure learning gain involves the Collegiate Learning Assessment (CLA), which has been trialled in several states. The CLA is designed to assess broad skills such as problem-solving, and to track students' acquisition of these skills and improvements in learning over the course of their degree. To do so, students are typically assessed both at the commencement of their degree and towards its conclusion. Analysis by Arum and Roksa (2010, 2014) suggests that many students are registering small or negligent learning gains, and that institutions appear to be adding limited value. These conclusions have themselves been contested (Benjamin, 2013; Pascarella, Blaich, Martin, & Hanson, 2011), and learning gain itself remains only a proxy for institutional value-add. Nevertheless, understanding performance requires attempts to measure learning gains and other potential contributions of the university to student growth and employability over the course of their studies.

The US experience also highlights the difficulties and issues of introducing benchmarking metrics in diverse sectoral settings. Two year community colleges, for example, typically attract much higher proportions of equity group students and record lower completion rates than four year colleges. Private for-profit providers often record extremely low completion rates and enrol high numbers of equity group students, who are supported by Pell grants and other federal funds. Some colleges are located in geographic areas with high levels of housing segregation and/or unemployment, which can also affect enrolment patterns of different student groups. To be effective, models need to promote quality while accounting for institutional diversity. As we will see subsequently, the level of institutional diversity is much lower in Australia and the UK. Greater homogeneity enables development of national approaches to performance funding but arguably also reduces the importance of such models, particularly where retention and completion rates are relatively high and stable across the sectors.

The United Kingdom

The Teaching Excellence and Student Outcomes Framework (TEF) in the UK follows the previous introduction of a Research Excellence Framework (REF), and seeks to elevate the status of teaching and learning in higher education and provide better information to prospective students (Morris, 2017b). The model is based on a range of student outcome measures and was initially designed to be linked to funding, with higher ranking institutions being allowed to increase their tuition fees by the rate of inflation. A subsequent freeze on tuition fees means the model currently has no direct funding implications for institutions, but the reputational implications of rankings are nevertheless driving substantial change, particularly with respect to the international student market (Johnston, 2018). Institutions are ranked according to three levels – bronze, silver and gold – and the results are designed to be widely publicised to prospective students, employers and other stakeholders.

Due to the complexity of the TEF, policy makers have designed the implementation to be incremental over time, with continuing development and improvement of the methodology (Gunn, 2018, p. 136). In the introductory year of 2015, institutions were only required to achieve a satisfactory assessment. The second year was the first full year of the TEF, and led to rankings quite different from the traditional research-based rankings exercises such as the ARWU (see Figure 3). Beginning as an institution-wide evaluation, the TEF is currently piloting a shift to the subject (course) level of evaluation to provide more granular analysis, and the model will eventually be extended to include postgraduate coursework (Gunn, 2018, p. 136).

In the initial stages, the TEF has used three existing data sources: the National Student Survey (NSS), which is used to measure teaching quality, assessment and feedback provision, and academic support; the non-continuation data from the Higher Education Statistics Agency; and the number of graduates in employment/further study or highly skilled employment/further study from the Destination of Leavers from Higher Education Survey (DLHE) (Gunn, 2018, p. 138). These measures have been used as proxies for teaching quality, but the limitations of the proxies have also been highlighted. For example, the inclusion of the NSS has been controversial because of the assumption that student satisfaction is a proxy for teaching quality (Marginson, 2017). As Simon Marginson (2017) has outlined, “Student satisfaction surveys are important in themselves, telling us something we need to know, it’s just that we cannot validly use them to measure something other than satisfaction”. A Department for Education review of TEF Year Two received many complaints that the NSS weightings were excessive, and the weighting for the NSS metrics has subsequently been halved, while the weighting for all other metrics remains equal to one (UK Department for Education, 2017, p. 35).

As in the US, distinguishing between outcomes and performance has therefore been a contentious issue in the UK. One result of this tension is a new series of work on measuring learning gains. The Government committed to developing a ‘learning gain’ metric to be incorporated in future years which will seek to measure ‘improvement in knowledge, skills, work-readiness and personal development made by students during their time spent in higher education’ (HEFCE, 2017b). The first phase of the learning gain program has concluded, with limited progress made due to difficulties in convincing students to participate (Kandiko Howson, 2017). However, the Office for Students remains committed to developing a learning gain proxy, and is now building on the first phase of studies to instigate a second phase of investigations into learning gain (Hawkins, 2018).

Our subsequent analysis of Australian data highlights the limitations of reliance on employment surveys conducted shortly after graduation (see figure 8). In the UK, a more sophisticated approach is emerging. With the development of a new data source –Longitudinal Educational Outcomes (LEO) – additional graduate outcome metrics now supplement the existing data from the Destination of Leavers from Higher Education Survey (DLHE). The LEO data links higher education enrolment data to tax and other administrative records, and shows earnings one, three, and five years after graduation for all subjects and universities (Morris, 2017a). In particular, the TEF will assess to what extent students have sustained employment or further study, or whether they have attained above the median earnings threshold (OfS, 2018a, Table 2). After several years of increasing proportions of ‘firsts’ being awarded to students, the Government has also prioritised the development of a measure of grade inflation (OfS, 2018a).

Student equity is a core consideration of the TEF, reflected in the consideration of split metrics that contextualise performance of equity group students, and in the contextual statements provided by institutions that form part of the assessment process. Split metrics involves subsections of the data to show performance within subgroups, and the background of students reflecting widening participation priorities. Performance across metrics is contextualised with data on the nature and operating context of an institution, including its size, location, and student population. The TEF features benchmarks which are a weighted sector average based on the characteristics of the students at the provider. Benchmarks allow meaningful comparisons by taking into account the different mix of students at each provider. This generates an “initial hypothesis” about an institution’s performance.

Each provider also makes a written submission. A panel of peers and experts is responsible for reviewing judgements made by TEF assessors, and making a decision on the submission as a whole. The judgement determines whether an institution obtains a bronze, silver, or gold rating. A gold rating means the provider has delivered consistently outstanding teaching, learning and outcomes, and is of the highest quality in the UK (Barkas, Scott, Poppitt, & Smith, 2017, p. 4). Silver is awarded for delivering high quality teaching, learning and outcomes, and consistently exceeds rigorous national quality requirements. Bronze is awarded for delivering teaching, learning and outcomes that meet rigorous national quality requirements. The written submission provides institutions with an important opportunity to add further context that may not be apparent in the data presented, and also to outline activities and plans already under way to improve on the underlying core metrics (Beech, 2017).

Initial results of TEF evaluations revealed the potential to disrupt traditional institutional rankings. Some highly selective universities such as the London School of Economics received the lowest rating of bronze. Responses to the early TEF results were diverse, but many emphasised the potential of the TEF to reshape rankings and reward performance beyond outcomes. Gordon McKenzie, chief executive of GuildHE (quoted in Parr, 2017), argued that:

"The TEF provides a welcome focus on university teaching and student outcomes - such as their employability. The results shake-up many traditional perceptions of "good universities" and excellent student experiences, which have relied too heavily on evaluating research performance. Importantly, this new government ranking bench-marks student data helps

take into account the difference a university makes to a student's progress. Other league tables reward universities for taking students with high A-level results in the first place without considering the distance the student has travelled."

Similarly, the then Director of the Office for Fair Access to Higher Education, Les Ebdon (quoted in Parr, 2017), welcomed the TEF results:

"I have always argued that, designed well, the TEF had the potential to improve outcomes for all students. So I am pleased that the metrics have taken students' backgrounds into account, as this will help universities and colleges to see where progress is being made for students from disadvantaged backgrounds, and where there are still unexplained gaps in attainment between the most and least advantaged. I look forward to continuing to work with those across the sector to ensure that teaching excellence means excellence for students from all backgrounds."

By contextualising institutional performance, the TEF could potentially support student equity in a way that the dominant international rankings do not. Most traditional rankings of institutions are based on outcomes without context, or any consideration of student equity (Coates et al., 2013). Furthermore, many of the most prominent rankings are heavily influenced by research metrics and vague reputational assessments, which creates a race in which a majority of institutions cannot ever hope to compete successfully (Altbach & Hazelkorn, 2017).

Notwithstanding the attempts to contextualise student equity, to measure learning gain, and to enable institutions to justify their distinctive missions, there remain concerns about the implications of TEF for student equity. In particular, MillionPlus – a consortium of universities in the UK – has criticised the focus on employment outcomes per se, the attempt to measure employment that is explicitly related to the degree studied, and the exclusion of any formal measures to account for different geographic contexts of institutions, and their related impact on graduate employment levels and salaries (MillionPlus, 2018).

Others have argued that employability is a necessary criterion if universities are to promote social mobility, and that it is possible to control for factors such as student background. Paul Blackmore and colleagues (2016, p. 41) claim that:

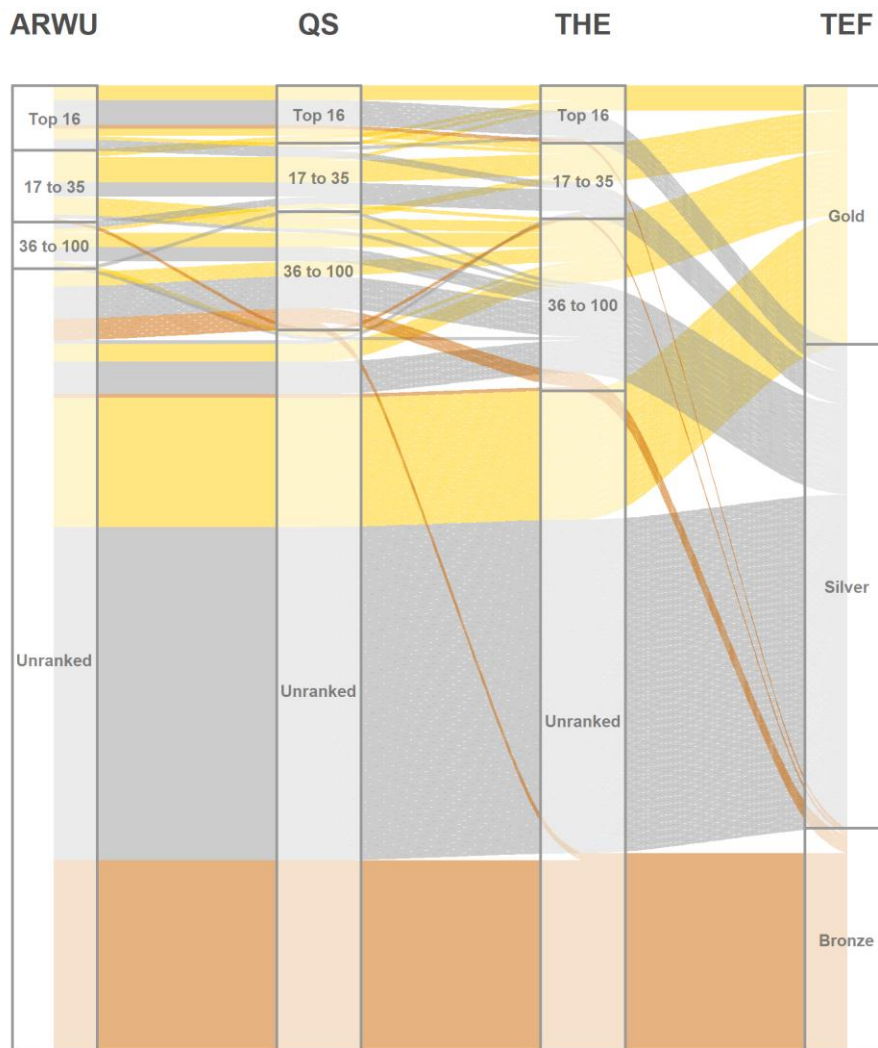
"A major concern is that employment outcomes largely reflect non-educational variables, such as entry standards, socioeconomic background and subject studied. Although these factors are influential, with good data statisticians can and do control for these variables to enable performance to be benchmarked. When they do, educational variables that make a difference, at least to early careers, emerge. Work experience integrated into the curriculum stands out, especially sandwich years and placements, alongside obtaining a good degree (first-class or upper second-class honours). Welcome proposals to collect more data on placements and work-based learning are made in the HESA review of DLHE."

The experience of the UK suggests the need to clarify and socialise the performance objectives within the sector. There has been strong awareness of the risks and potential of the TEF to reward selectivity rather than performance, which has correlated with broad consensus on the need to

account for student inputs and other contextual factors when assessing outcomes. Disputes over the metrics employed remain, and Nick Hillman from the Higher Education Policy Institute (quoted in Parr, 2017) notes of the initial publication of TEF results that: ‘While it tells us a lot of useful things, none of them accurately reflects precisely what goes on in lecture halls.’

Figure 3 shows the disruptive capacity of the TEF. The figure shows correlations between institutional performance across three prominent international rankings tables, and performance within the initial TEF rankings. The Academic Ranking of World Universities (ARWU) relies almost exclusively on research metrics, while the QS and Times Higher Education (THE) rankings are also research-focussed, though the THE rankings do include measures of the learning environment, such as student-staff ratios (THE, 2018). All three rankings are correlated, but figure 3 highlights the extent to which TEF rankings are not strongly correlated with any of the other three rankings. By developing more diverse metrics that integrate student equity and control for student inputs, the TEF highlights the potential to develop alternative international rankings, and/or to integrate new measures into existing rankings. Such developments could have substantial reputational implications given the centrality of league tables to international student enrolments in particular, and to other funding sources.

Figure 3: Institutional rank movements between selected UK higher education rankings and TEF outcomes



Source: ARWU (2018); OfS (2018b); Quacquarelli Symonds (2018); THE (2018)

Notes: In all, 269 higher education institutions are included in the analysis. Institutions with the TEF outcome of 'Provisional' have been excluded.

Performance in Australian Higher Education

The following section explores performance across the Australian higher education sector. We begin by outlining the evidence on widely used metrics of performance in international contexts, including student success, retention, satisfaction, completions, and graduate outcomes. Overall, the Australian sector fares relatively well on these metrics, and there is little variation among institutional outcomes relative to contexts such as the US. Nevertheless, there are areas of potential concern. Compared with public universities, non-university higher education institutions (NUHEIs) record a much broader range of outcomes across all metrics. While NUHEIs do not appear to be in scope for the Government's proposed performance funding system, they typically feature among both the highest and the lowest performing institutions across the sector. Examining the role of NUHEIs, which are growing rapidly and presently account for over seven per cent of national enrolments, is important in developing a coherent and comprehensive assessment of sectoral performance.

The levels of student satisfaction and retention in Australia also remain below those recorded in the UK, suggesting room for improvement on both fronts. Equally, when overall performance results are disaggregated by enrolment factors, student groups, and institutions, some patterns of concern are manifest. Uppermost here is the explicit Government concern that institutions are enrolling academically under-prepared students into undergraduate degree programs (HESP, 2016, p. 2). There is some evidence, though limited, to support this claim. For example, completion rates are only around 50 per cent for the small proportion (2.9%) of students accepted on the basis of an ATAR below 50 (See Figure 10). As we have argued elsewhere though (Harvey 2017; Pitman et al., 2016), expanding and codifying sub-degree pathways would largely help to resolve this particular issue. Students enrolled on a part-time basis, through distance (online) education, and in particular fields of education, also record relatively low completion rates.

Performance metrics are also marked by paradox. Part-time and distance education students, for example, are less likely than other students to complete their degrees but have relatively strong graduate outcomes if they do. How a performance model might account for these different, often contradictory trends presents a significant assessment challenge. Institutions also record very different levels of performance depending on the metrics assigned. The most selective institutions, known as the Group of Eight, typically record the highest retention and completion rates. Their short-term employment outcomes, however, are significantly lower than the less selective Regional Universities Network institutions, based on the current national survey of graduates. Performance funding certainly has the potential to disrupt traditional rankings, as it has done in the UK (see Figure 3). However, the challenges of measuring performance are substantial, as evident from a rudimentary analysis of disaggregated metrics.

Complicating any attempts to distinguish institutional performance from outcomes is the consideration of student equity. Our analysis reveals that students from the six identified equity groups typically record lower performance on most metrics than other students. The underlying reasons for this apparent under-performance, however, usually relate to factors correlated with their equity status rather than the status itself. For example, regional students are more likely to be older, distance, and/or part-time students, three factors correlated with lower completion rates. Interestingly though, among equity group students there also exist some highly variable outcomes.

Indigenous students have relatively high attrition rates but record better than average short-term graduate outcomes. For NESB students, the reverse is true, with higher than average retention but graduate employment outcomes well below average (see Figure 12). Of course, the current metrics only capture some aspects of employability, and do not directly account for long-term progression, employment satisfaction, or broader issues such as experiences of workforce discrimination and racism.

Whether performance modelling addresses equity group status itself, or the factors correlated with it, is a design question. Ultimately though, the factors responsible for lower outcomes need to be addressed in order to avoid conflating outcomes with performance and consequently reducing the incentives for universities to widen participation. Indeed, performance funding has the potential to promote widening participation if appropriate metrics are selected. Access of equity students is itself a performance metric under the HESA (2003) objectives. When we examine data at institutional level, we see substantial variation in the promotion of equitable access, with some universities appearing to make little effort to enrol equity group students. Assessing institutions on the basis of equitable access, as a specific metric of performance, could create a significant incentive for the most selective institutions to develop strategies to broaden their participation.

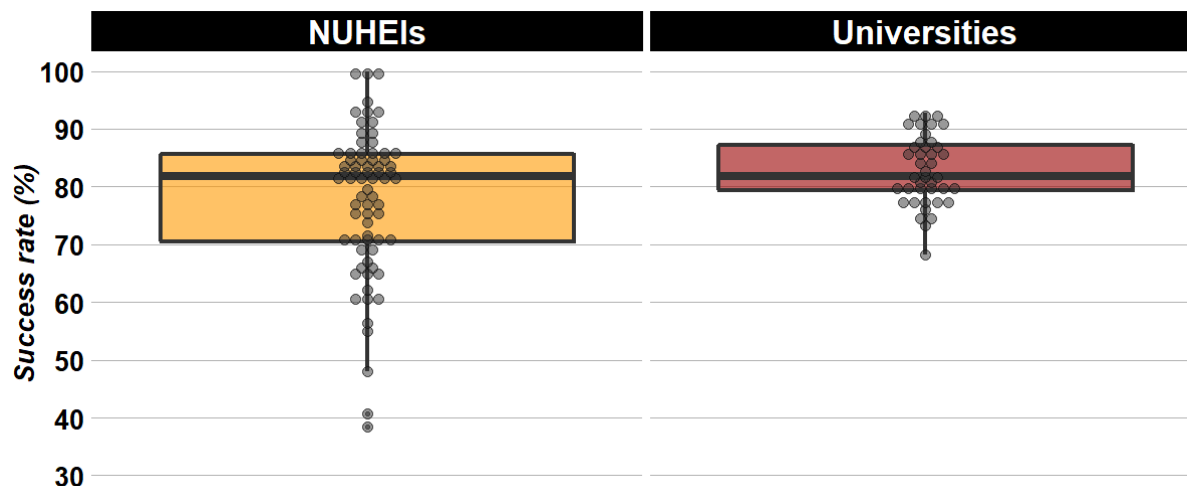
In the following sections, we present data that capture the spread of performance between different groupings and systems. Institutional group members are outlined in Appendix A, and include the most academically selective institutions (Group of Eight); the universities that serve predominantly regional and rural students (Regional Universities Network); and the Innovative Research Universities (IRU) and Australian Technology Network (ATN) institutions. Some universities are non-aligned, while non-universities are considered in aggregate for data purposes, despite their own substantial diversity. We use box and whisker plots to chart the distribution of performance across different higher education sectors. The 'box' shows the median (middle line) and interquartile range (top and bottom ends) of a given distribution, and the 'whiskers' are 1.5 times the value of the interquartile range. Conventionally, observations that lie outside of the whiskers on either end are outliers. Box plots alone can disguise a range of differing distributions, so a dot plot has been superimposed, where each dot is a unique higher education institution.

Success

In Australian higher education, the 'success rate' measures the number of units successfully completed as a proportion of all subjects undertaken. As the figure below shows, student success rates for Australian universities are higher on average, and less dispersed, than in Australian NUHEIs. Success rates have also increased over time. The UK does not have a measure of success that is comparable to Australia, but the British Government does publish information on student grades.

On first glance, student success rates would appear to be a sound indicator of teaching quality and institutional performance. However, while high success rates could be a sign of exemplary teaching, the same rates could also potentially be an indicator of declining rigour in assessment (Sadler, 2009). In the UK, a steady rise in the share of students being awarded 'firsts' has led some to suspect grade inflation (Bachan, 2017, p. 1581). As a response, a 'grade inflation' metric has been considered for incorporation within the TEF (Bagshaw, 2017; OfS, 2018a, p. 39).

Figure 4: Commencing undergraduate domestic student success rates for Australian universities and non-university higher education institutions, 2017



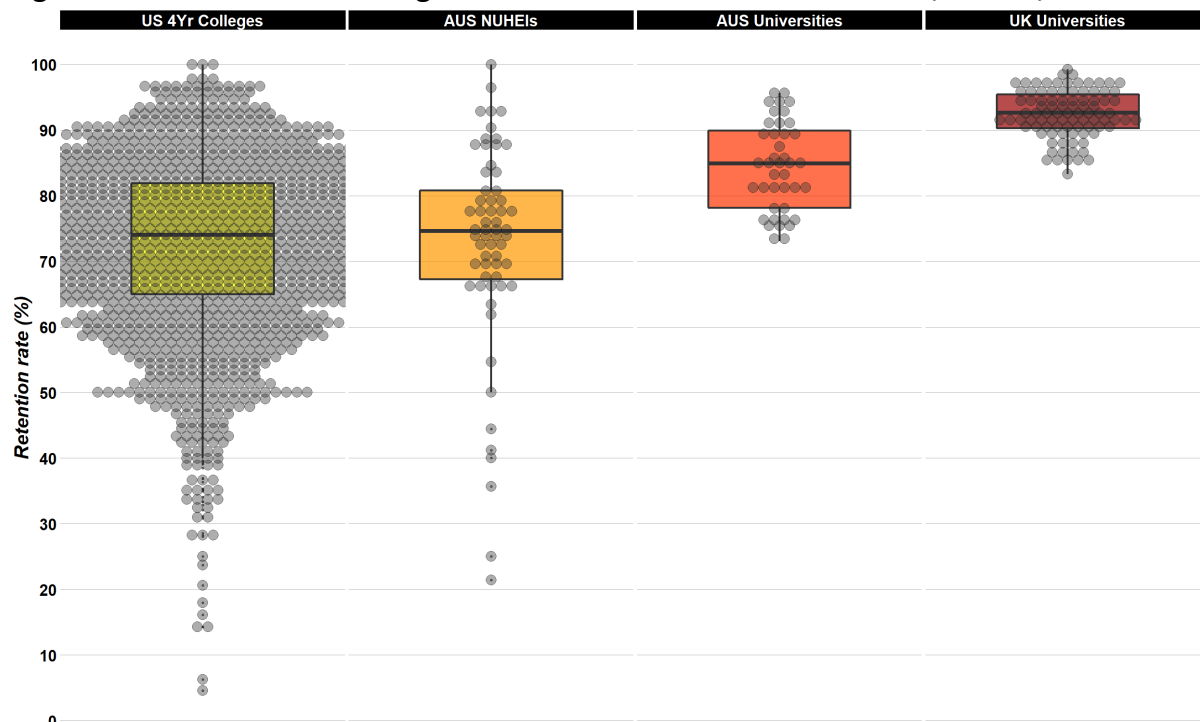
Source: Department of Education and Training (2017)

Notes: NUHEI success rates also include sub-bachelor level undergraduate students, while university success rates only include bachelor level students.

Retention

Despite concern over the extent of enrolment growth under the demand-driven system, Australian university retention rates have remained stable for over a decade and have actually continued to improve since 2015 (Department of Education and Training, 2018e). Figure 5 shows the median retention rate for Australian universities currently sits above the US and just below UK institutions. Interestingly, the median for Australian NUHEIs is approximately equal to the US 4-year degree retention rate. Compared to the US and the Australian NUHEIs, Australian universities have a relatively even spread of retention rates, none of which falls below 60 per cent. In the UK there are major disincentives for studying part-time – a widely documented risk factor for attrition – which has led to more than a third fewer part-time students in 2016-17 than were enrolled a decade earlier (Universities UK, 2018, p. 14), and to a particular decline in low SES enrolments. All things equal, this should mean the UK retention rate is higher across the board than countries such as Australia, where there are fewer direct disincentives for students to engage in part-time study.

Figure 5: Retention rates for higher education institutions in Australia, the UK, and the US



Source: Department of Education and Training (2017); HESA (2018); NCES (2018)

Notes: Years are for 2016 in the US and Australia. The UK records a separate non-continuation rate for full-time and part-time students. For part-time students, non-continuation is taken two years after commencement for 2014-15, whereas for full-time students it is only a year after commencement for 2015-16.

The spread of retention rates across Australian universities has been relatively narrow compared to other sectors, although in recent years some universities have drifted further away from the median. Formal attrition rates in Australia are also exacerbated by limitations in the metrics adopted. Our study of attrition and re-recruitment in 2017 found that around half of the students who withdraw from Australian higher education are re-enrolled in the sector within the subsequent eight years, suggesting that many students would be considered ‘stop-outs’ rather than ‘drop-outs’. Moreover, around twenty per cent of those who withdraw ultimately return to the sector just a year later, suggesting that some of what is currently counted as attrition simply represents students taking a leave of absence (Harvey, Szalkowicz, & Luckman, 2017, p. 30).

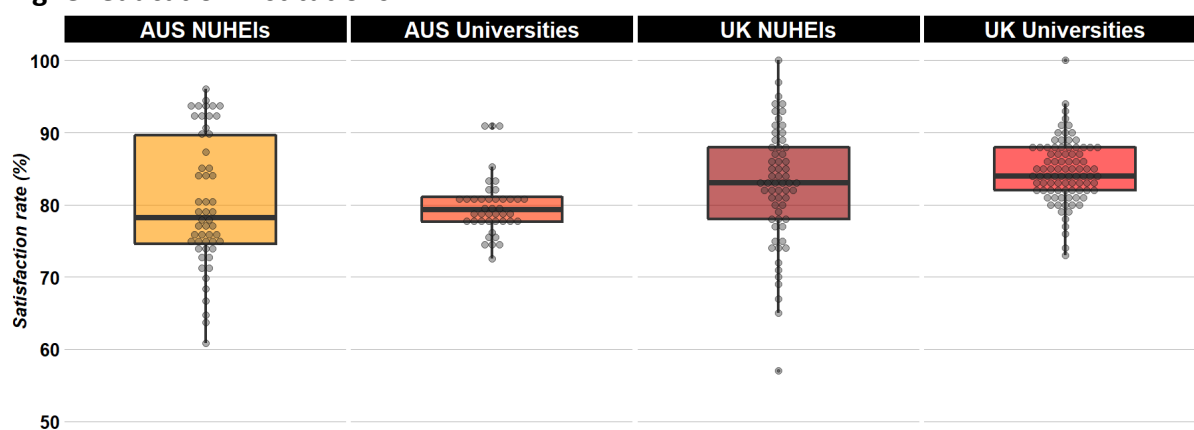
Retention results also reveal the difficulty in accounting for contextual factors. The Australian Government has previously used regression techniques to estimate performance after controlling for possible confounding effects, but these regression estimates are not viewed with great confidence by much of the sector (Coaldrake & Stedman, 2016). A recent study on attrition by the Higher Education Standards Panel (HESP, 2018) modelled attrition rates across institutions to derive modified rates that took into account possible confounding factors. The modelling did change the estimated attrition rates but it did not dramatically change the rank of institutions (HESP, 2018). Most of the explained variation was estimated to be due to the institution, with external and part-time status also accounting for a portion, but the model itself only explained at most about a fifth of

all the variation in the data (HESP, 2018). The study suggests that most attrition is explained by variables outside of the Government data collection, or complex interplays between variables that are not picked up by the model. Ultimately, such modelling also suggests that our ability to control for confounding factors is still very limited.

Student Experience

Student experience surveys are commonly used as proxies for teaching quality. In Australia, data is collected through the Student Experience Survey (SES), which probes current students on a range of aspects relating to their university experience, including: skills development, learner engagement, teaching quality, student support, and learning resources (Social Research Centre/Department of Education and Training, 2018a). The UK and the US sectors oversee similar surveys. The British Government has incorporated the National Student Survey (NSS) results into the TEF which has provided a valuable student voice, but also proved controversial among those who view student satisfaction as a limited or inaccurate proxy of teaching quality (Kernohan, 2018).

Figure 6: Student satisfaction with overall educational experience for Australian and UK higher education institutions



Source: (HEFCE, 2017a); Social Research Centre/Department of Education and Training (2018a)

Notes: The Australian SES asks students whether they are satisfied with their entire educational experience at their institution. The UK NSS asks the subtly different question of whether, overall, they are satisfied with their course.

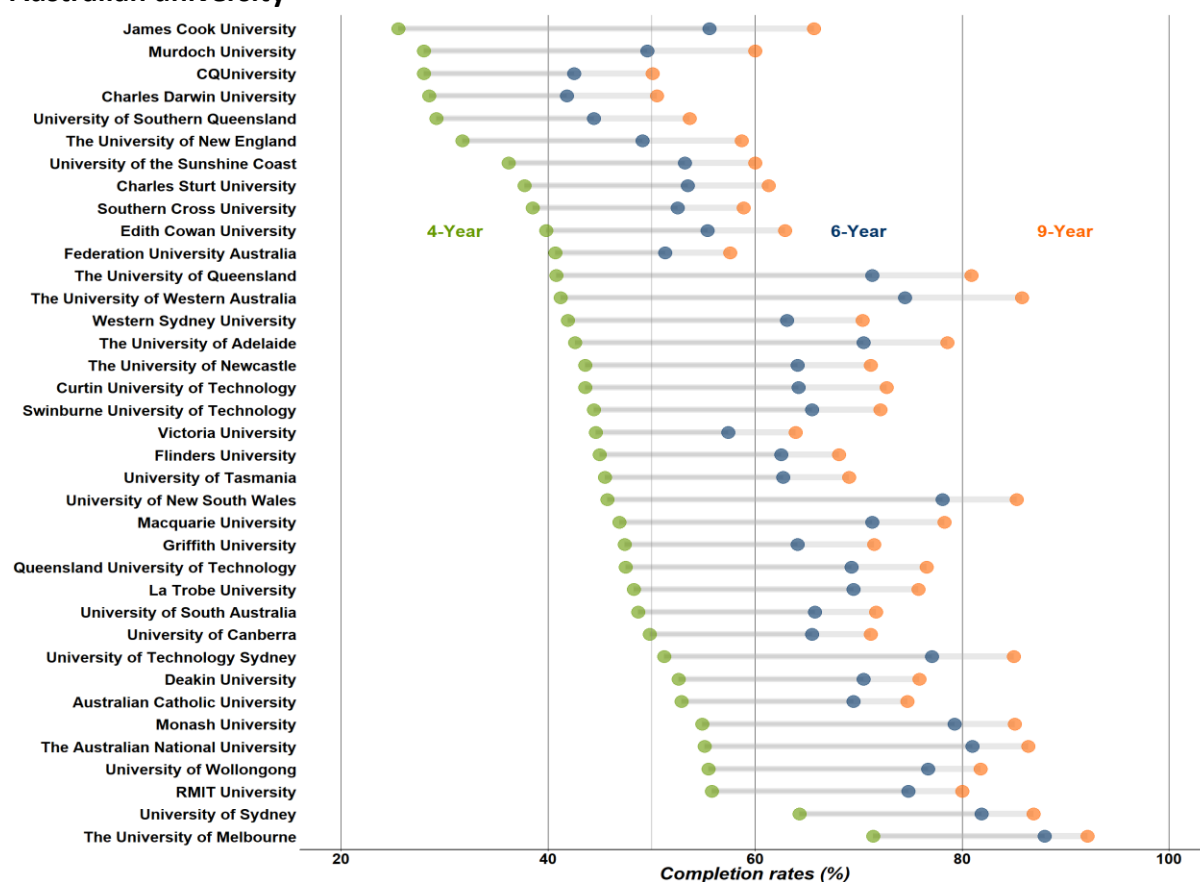
As Figure 6 shows, students at Australian universities record somewhat lower levels of 'overall satisfaction' than those in most non-university providers or those within UK universities. There is, however, little difference among the Australian public universities, complicating any attempts to measure institutions by their relative performance.

Completion

Completion rates are typically measured by tracking students from commencement using a unique identifier and examining those who have graduated at four, six, and nine years out, as a proportion of those in the initial commencing cohort. As Figure 7 below shows, there are large differences

depending on what point completion is measured. At four years out from commencement, the completion rate for the majority of institutions is below 50 per cent, yet at six years after commencement completion rates have drastically improved, with nearly every university showing rates above 50 per cent. Nine years on from commencement, completion rates improve further still. The variation between university completion rates also shrinks the further from commencement that data are observed. Within Australian universities, overall six year completions are 65 per cent, which rises to nearly 80 per cent of students completing their degree within nine years (Department of Education and Training, 2018a). Several NUHEIs, however, record completion rates below 50 per cent even nine years on from commencement.

Figure 7: Four, six, and nine-year completion rates for the 2009 commencing cohort by Australian university



Sources: Department of Education and Training (2018a)

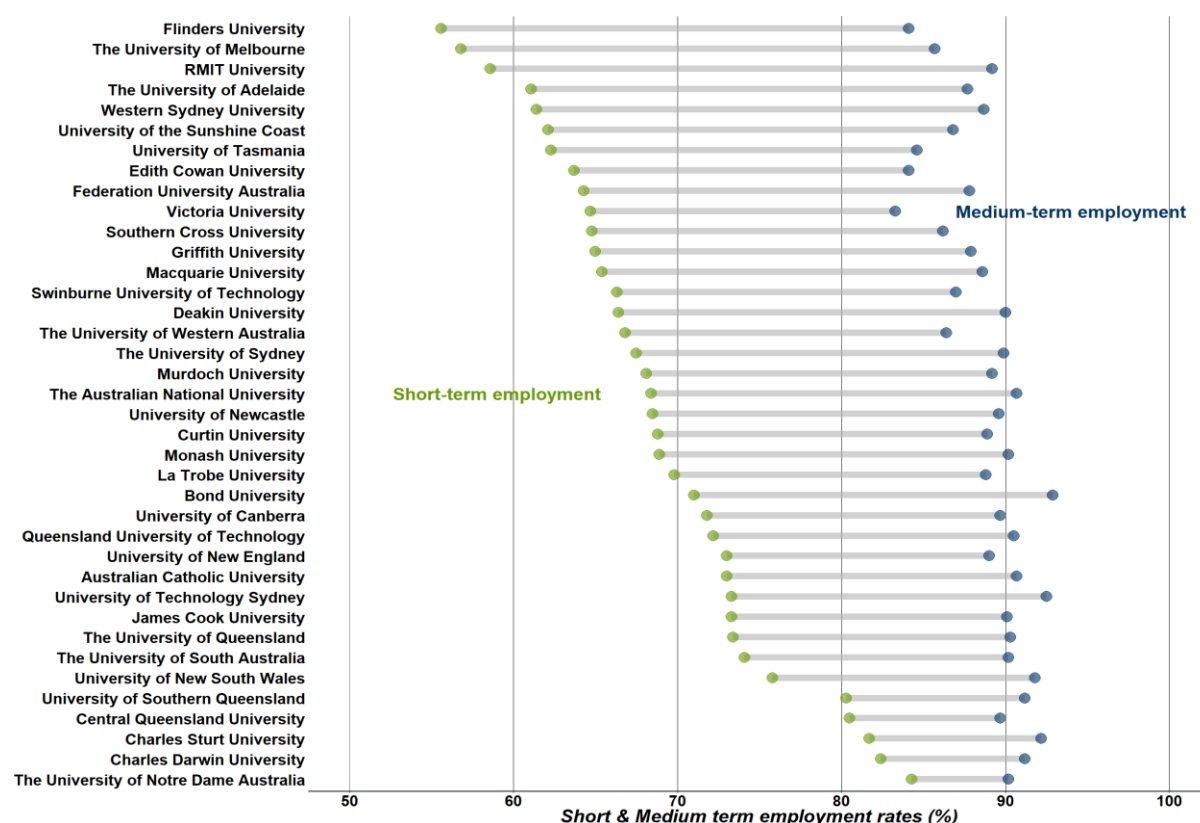
Notes: Only includes domestic bachelor students that commenced their course in 2009.

Graduate Outcomes

Graduate outcomes are often measured using a range of indicators, including: the proportion of graduates in full-time employment in the short, medium and long term; the proportion of graduates in further study; the median salary for graduates in the short term and over time, including estimates of lifetime returns; measures of qualifications matched to employment; and feedback

from employers about the quality of graduates. In Australia, recent graduates are surveyed four months out from graduation to provide details on their activities. A sub-sample of those surveyed are then followed up three years later. Full-time study and full-time employment rates are available for all Australian universities, although the data for NUHEIs is too sparse to make meaningful comparisons. Short-term employment rates vary significantly between Australian universities, yet this variation shrinks over time, as graduates interact with the labour market. As Figure 8 below shows, three years after graduation, there is much less variation between the full-time employment rates for universities, and many more graduates on average are employed than they were four months out.

Figure 8: Short and medium-term graduate full-time employment rates for the 2015 graduate cohort by Australian university



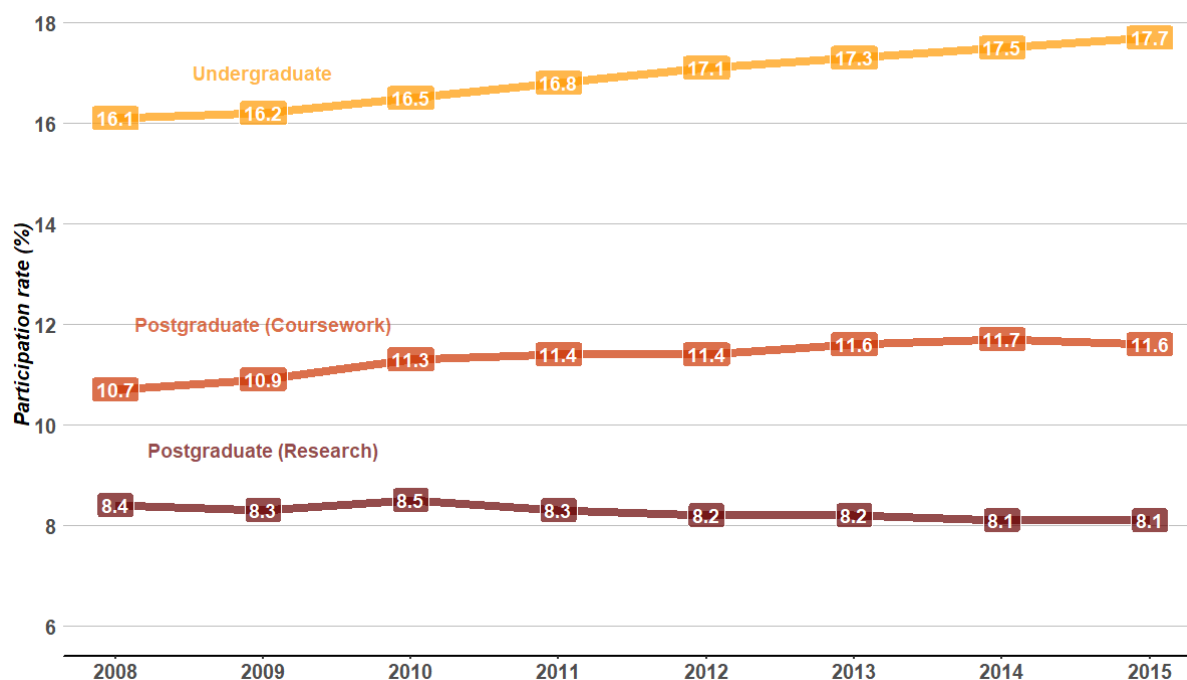
Source: Social Research Centre/Department of Education and Training (2018b)

Notes: Short-term is four month after graduation and medium-term is three years after graduation.

Postgraduate education reveals significant disparities by institution and by equity groups. While Group of Eight universities record relatively poor graduate outcomes for those seeking employment, these universities collectively enrol the majority of postgraduate students nationally. This dominance reflects broader funding policies and allocations. Universities in the Group of Eight receive over 60 per cent of the available funding for research postgraduate places (Department of Education and Training, 2018d). Equally, Group of Eight universities currently hold approximately 40

per cent of the Commonwealth Supported Places designated toward postgraduate study (Department of Education and Training, 2018c). As Figure 9 and Figure 13 highlight, a secondary effect of this institutional disparity is a disparity among student groups, such that equity students are considerably under-represented in postgraduate education. Low SES students are under-represented at undergraduate level within the universities that enrol the majority of postgraduate students, partly because of lower prior attainment, e.g. ATAR. An institutional pipeline effect then contributes to ongoing (and worse) under-representation at postgraduate level.

Figure 9: Participation rate for low socio-economic status students in Australian higher education by level of qualification



Source: Department of Education and Training (2016a)

Notes: Only includes domestic students from Table A institutions.

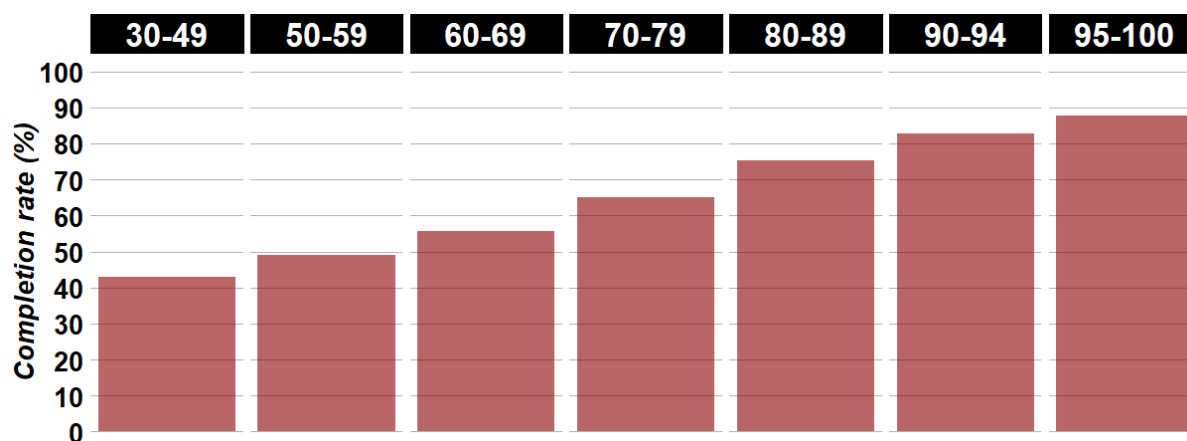
Institutional context and equity

The previous section revealed that traditionally measured outcomes across Australian public universities do not vary widely, and that there are no glaring issues of under-performance. There is more substantial variation across the non-university higher education institutions (NUHEIs), which share a Dickensian sense of being both the best and worst of performers. Among some NUHEIs there are concerning cases of relatively low retention and completion. Conversely, some private universities and NUHEIs record the highest levels of student satisfaction in the sector. This variability provides two important general principles for the design of performance funding. First, NUHEIs would ideally be included in a performance framework as they represent the highest risk institutions on most metrics, as well as the exemplars. Equally, designers need to promote diversity of institutional missions while simultaneously ensuring quality. The much lamented homogeneity of Australian public universities (Davis, 2017) could be further exacerbated by a performance funding system that drives institutions to the centre through a proliferation of metrics (NZ Productivity Commission, 2017).

The broad tension between promoting diversity and ensuring quality can be seen both through an examination of outlying institutions, and through an examination of how performance factors are correlated. The retention rates, both normal and adjusted, of the University of Tasmania and Swinburne University of Technology have accelerated downward since the implementation of demand driven funding. However, universities at the edge often explain their position by reference to context and diversity of mission. In the case of the University of Tasmania, for example, staff argue that the particular model of diplomas, associate degrees and degrees is partly responsible for lower than average retention rates (Hare, 2016). Equally, it is noted that Tasmania is the most financially disadvantaged state in Australia, with nearly half of the population considered low SES on national indicators (Koshy, 2017, p. 9). Nevertheless, to address these high attrition rates the University of Tasmania has enacted new policies such as the automatic unenrolment of non-participating students, resulting in a dramatic increase in retention according to 2018 data. Equally, the University of Tasmania has above average rates of graduates in full-time employment.

Similarly, Swinburne University has some of the lowest retention rates in the country, but records above average ratings of overall satisfaction and teaching quality in the student experience survey. Swinburne has dramatically improved its equity of access by expanding its offerings through distance education, but that growing mode of study has also resulted in higher institutional attrition. Regional universities that record strong employment outcomes and promote equity of access are also typically low performers on retention and completion, partly because they accept students who are less academically prepared, and/or students studying part-time and through DE. As Figure 10 shows, there remains a relationship between ATAR and completion. At the most selective universities, the admission floor is an ATAR of 80, and retention and completion rates reflect the selectivity of admissions. Putatively strong outcomes may potentially not reflect performance but simply the nature of student inputs.

Figure 10: Six-year completion rate for the 2012 commencing cohort by ATAR range



Source: Department of Education and Training (2018a)

Notes: This only includes for domestic bachelor students.

Indeed, the extent of the assessment challenge is highlighted by examining the correlations between traditional performance indicators. Some indicators are strongly correlated with others, some not at all, and some negatively so. Figure 11 below shows the correlation co-efficient between different performance indicators across public universities. Retention is highly correlated with completion (correlation co-efficient = 0.78), which suggests that universities with higher retention rates also have higher completions. Conversely, graduate employment has moderate negative correlation with completion (correlation co-efficient = -0.25), suggesting that universities with relatively high completion rates often have lower than average levels of graduate employment. Success rates are also correlated negatively with graduate employment. By contrast, part-time status is positively correlated with graduate employment, but negatively correlated with all other factors. Perhaps most intriguingly, student satisfaction is not positively correlated with any other factor, and is indeed negatively correlated with employment outcomes (co-efficient = 0.33).

In summary, the inter-relationship of performance factors is complex. The apparent paradoxes among factors suggests a need for further research into 'learning gain' and other metrics that might provide more accurate proxies of performance. The data also highlight that some of the existing proxies are flawed, incomplete, or sub-optimal. For example, student satisfaction and graduate employment outcomes are both important indicators but there remain questions over the utility of current survey data to drive funding decisions. In the UK, institutional context is a significant factor in the assessment of performance, represented through a fifteen page contextual statement. A similar process in Australia, and/or the inclusion of optional metrics as advocated by the Regional Universities Network (Nous Group, 2018, p. 1), might mitigate risks of unfairness, and increase institutional support for a performance funding model.

Figure 11: Correlation between performance indicators for Australian universities, 2017

	Employment	External	Part.time	Satisfaction	Retention	Success	Completion
Employment	1						
External	0.52	1					
Part.time	0.5	0.95	1				
Satisfaction	-0.33	0.02	-0.03	1			
Retention	-0.23	-0.74	-0.76	-0.05	1		
Success	-0.18	-0.66	-0.61	-0.08	0.77	1	
Completion	-0.25	-0.57	-0.55	-0.05	0.78	0.87	1

Source: Department of Education and Training (2017, 2018a); Social Research Centre/Department of Education and Training (2018a); (Social Research Centre/Department of Education and Training, 2018c)

Notes: ‘Employment’ is full-time employment rates four months out from graduation. ‘External’ is the proportion of students enrolled in distance education. ‘Part-time’ is the proportion of students enrolled part-time. ‘Completion’ is the latest cohort completion rate six-years after commencement. ‘Satisfaction’ is the proportion of students satisfied with the quality of the entire educational experience at their institution. ‘Retention’ is the new adjusted retention rate (see Appendix B). ‘Success’ is the success rate of the institution.

Equity group performance

Similar complexity and paradoxes of data can be found when examining the specific performance of the six identified equity groups in higher education. As Figure 12 highlights, students from equity groups typically record slightly lower retention, completion and graduate outcomes than students overall. The two largest statistical groups – low SES and regional students – both have slightly lower retention and completion rates than students overall. Indigenous students have significantly lower retention rates. Students with a disability and from non-English speaking backgrounds record lower graduate outcomes, on average, than other university graduates. These data alone highlight the need to integrate student equity into any effective performance funding model.

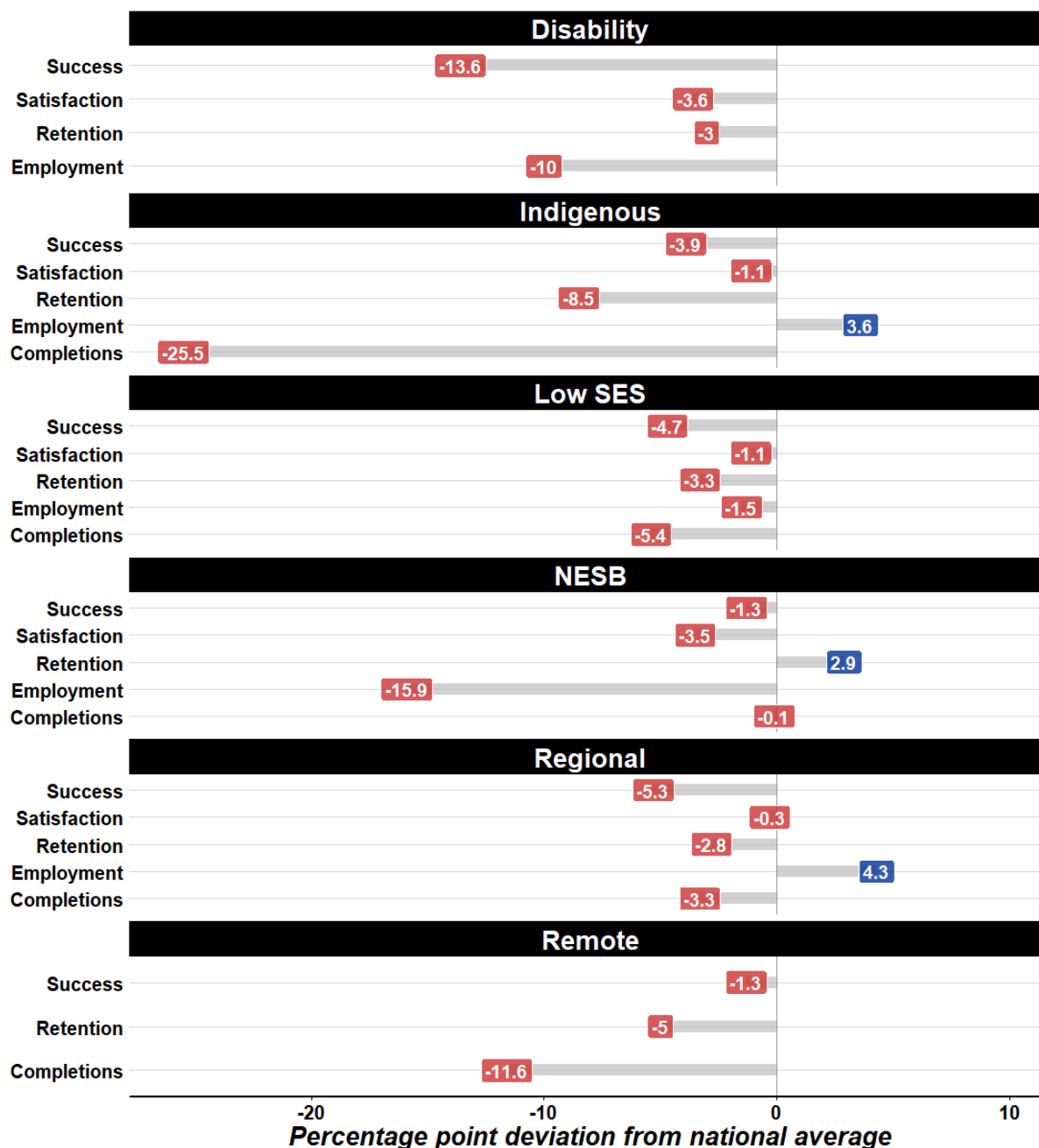
The reasons for sub-optimal outcomes are multiple. A major factor is prior academic achievement (Norton et al., 2018a, pp. 24-25). Low SES and regional students are more likely to be admitted to university with relatively low prior achievement, e.g. ATAR, and more likely to be undertaking a course that was not their first preference (Cardak, Bowden, & Bahtsevanoglou, 2015). As we have noted (figure 10), these conditions affect the likelihood of their completion. In addition, students from equity groups are typically more financially disadvantaged than other students, which can affect completion times and rates.

Students with a disability and from non-English speaking backgrounds may face unconscious bias from employers when applying for jobs (Dechief & Oreopoulos, 2012). In most cases, the factors that influence outcomes do not relate to equity group status as such, but to the overlap between that status and other external factors. Regional students are more likely to be enrolled as part-time, older, and/or by distance, and each of these factors is correlated with lower retention and completion. Finally, low SES and other equity students are under-represented at postgraduate level, owing to the dominance of Group of Eight institutions in receiving postgraduate CSP and research funding, and a propensity of equity students to select more professionally based undergraduate degrees (Teese, 2007, pp. 57-58).

Overall, the outcomes of equity group students reveal the risks to widening participation under a performance funding regime that does not integrate student equity and does not control carefully for inputs. If universities were motivated to increase retention and completion rates under a model that did not adjust for inputs, they would likely focus on restricting access more than value-adding initiatives. This increased selectivity is precisely what has happened in a number of American jurisdictions, to the detriment of under-represented student groups (see section on the US experience).

Unlike in the UK and US, relatively little work has been done in Australia to measure ‘learning gain’ and other metrics that might capture the value added by individual institutions (see section on the UK experience). However, we do know that current outputs substantially reflect student inputs. For example, we know that school-leaving students accepted into university with ATARs above 80 are highly likely to be retained and complete their degree (Norton et al., 2018a, p. 24), irrespective of institution.

Figure 12: Percentage point deviation of equity group performance metrics from the overall average



Source: Department of Education and Training (2017, 2018a); Social Research Centre/Department of Education and Training (2018a)

Notes: ‘Completions’ refers to the six-year cohort completion rate. ‘Employment’ refers to the short-term full-time employment rate for the Graduate Outlook Survey.

As outlined previously, it is important not only to control for equity among traditional performance metrics, but also to consider equitable access as a fundamental objective of Australian higher education. Providing access for equity group students is an explicit legislative objective under HESA (2003), and institutions should arguably be measured for their performance against this objective. The current performance of Australian higher education institutions in advancing student equity is extremely variable. At one extreme, a small number of NUHEIs do not enrol any students from low SES backgrounds (Brett, Tootell, Harvey, Cardak, & Noonan, Forthcoming), and over 80 per cent of students at the Australian National University hail from the top two socio-economic quintiles. Conversely, more than half of enrolments at the Central Queensland University are from students within the lowest socio-economic quartile (Department of Education and Training, 2018e). HEPPP funding currently provides some reward funding for universities enrolling low SES students, but differential outcomes could be further included within overall performance funding frameworks and information provided to prospective students.

Equally, diversity of access is an objective within the Higher Education Support Act. There are multiple forms of diversity, including Indigeneity, ethnicity and gender. Providing higher education opportunities to Indigenous students is central to HESA (2003) and the objectives of Universities Australia. The Government currently provides a small amount of funding to universities for Indigenous student enrolment and success, but again the relative commitment and performance of institutions could be included within a broader performance framework. Previous schemes, such as the LTPF, excluded some diversity measures, which contributed to the university with the highest representation of Indigenous students receiving no reward funding over the life of the scheme (see section on the LTPF). Similarly, supporting ethnic, gender, and cultural diversity is important to the quality of learning for all students. 'Inclusive excellence' refers to how student (and staff) diversity can be harnessed to increase teaching and learning quality, as well as the student experience.

Research by Chang (1999) reveals that the likelihood that students will engage with students who are from different backgrounds increases as the compositional diversity of the campus increases, and related research confirms that universities are more influential when they offer students 'a social and intellectual atmosphere that is distinctively different from that with which they are familiar' (Milem, Chang, & Antonio, 2005, p. 8). Relatedly, minority influence theory shows how minority opinions can serve to increase cognitive complexity among majority opinion members (Gruenfeld, Thomas-Hunt, & Kim, 1998).

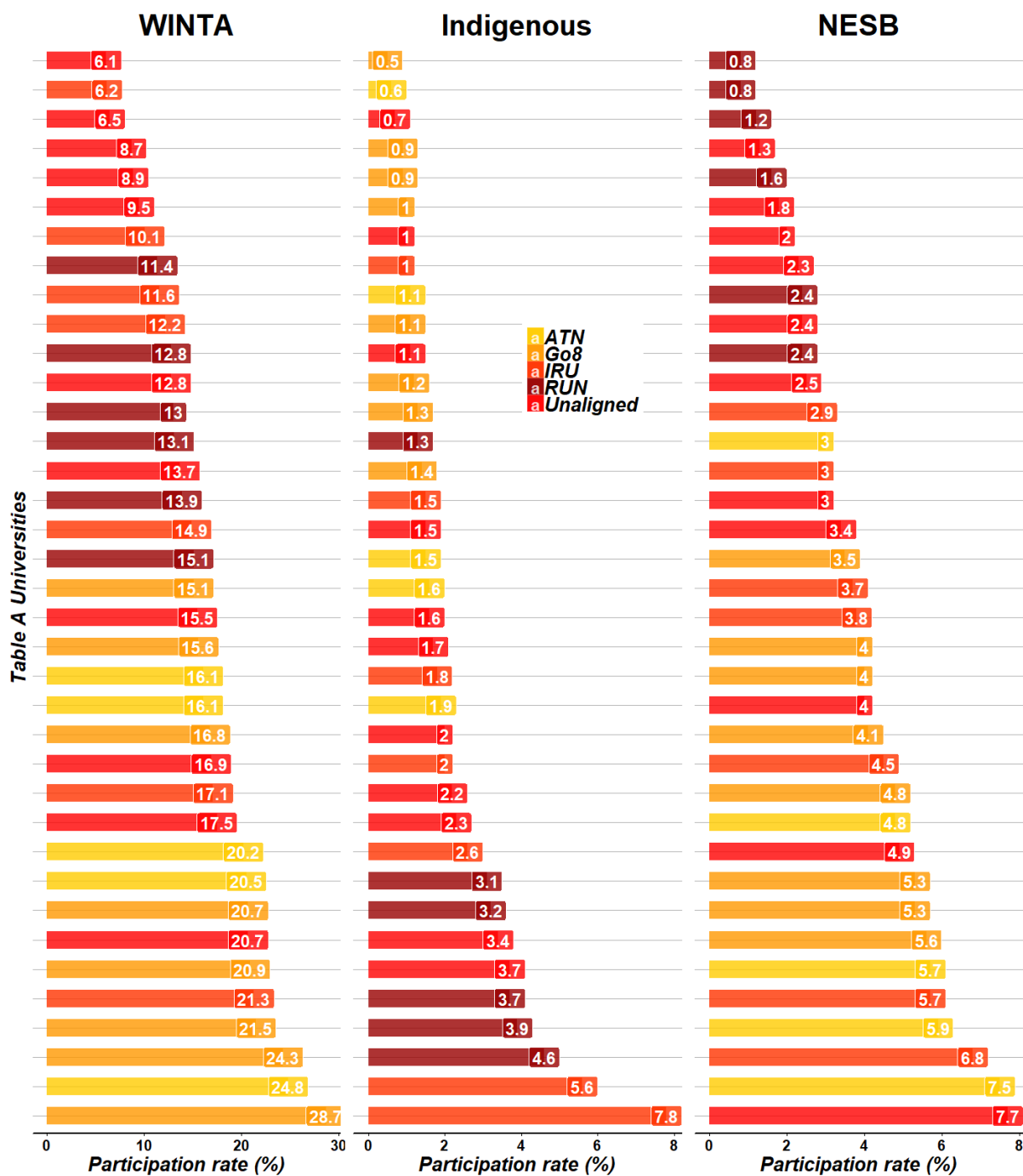
Consistent with the HESA (2003) objectives, institutional commitment to student diversity could therefore be seen as a metric of performance in its own right. If so, results would differ substantially among institutions, and traditional research-based rankings would be disrupted. Further work on developing metrics around 'learning gain', as well as potential amendments to student experience surveys to capture cognitive development and diversity interactions, could both help to capture and quantify the benefits of student diversity. In the interim, measures of compositional diversity, such as those outlined in Figure 13 and Figure 14, could be employed to identify those institutions most committed to diversity of access.

Figure 13: Participation rates for low socio-economic status students, and students from regional and remote areas, 2017



Source: Department of Education and Training (2018e)

Figure 14: Participation rates for women in non-traditional areas (WINTA), Indigenous students, and students from non-English speaking backgrounds (NESB), 2017



Source: Department of Education and Training (2018e)

Conclusion

Our examination of contemporary Australian data confirms the importance of principles developed in our earlier international and historical analyses. Above all, evidence underlines the need to integrate student equity into design of an effective performance funding model. As in other international contexts, equity group students in Australia are clearly at risk under any model that simply rewards inputs and outputs rather than the value added by institutions.

Secondly, our research reveals the need to reward performance rather than outcomes, in order to ensure an equitable and effective performance funding model. Data confirm the overall strength of the Australian higher education sector but also suggest some clear areas of apparent under-performance. Performance against many existing indicators appears both relatively strong and homogeneous among public universities, suggesting that isolation of the value added by institutions will be difficult. However, substantial variability does exist among non-university institutions and among some student groups. The variability reveals the desirability of including all higher education providers in performance frameworks, and also of developing specific performance metrics around equitable access and student diversity. As in other contexts, some Australian institutions reveal a greater commitment to equity and diversity than others, and performance against national equity objectives could be more explicitly measured and rewarded.

Detailed examination of existing Australian evidence reveals that many factors of performance appear uncorrelated, or indeed negatively correlated, with each other. Such complexity highlights the need for more sophisticated and accurate metrics to identify teaching performance, learning gain, student satisfaction, and employment outcomes. Both the historical Australian attempts to measure performance, and equivalent attempts in the UK and US, have struggled to reconcile the imperfections and paradoxes of proxy measures.

Finally, we have emphasised the need for performance funding models to be student-centred. The methodology of performance funding can become extremely complex. While accurate and sophisticated data is necessary to isolate genuine institutional performance, models also need to be student-centred to be effective and equitable. Historical attempts to provide better information for prospective students have seen limited success, partly because of the paucity of student trust and consultation. Positioning students at the centre of performance funding would involve explicitly including their voices and views within the metrics, including them in design and project consultation phases, and ensuring that new information produced is widely accessible, digestible, and useful, particularly to prospective and under-represented students.

By integrating student equity, distinguishing performance from outcomes, and positioning students centrally, it is possible to envisage an effective and equitable performance funding model. Such a model would reward institutions that best contribute to the national higher education objectives.

Appendix A: University Groupings

Table A: Australian universities by university groupings

Group of Eight (Go8)	Australian Technology Network (ATN)	Innovative Research Universities (IRU)	Regional Universities Network (RUN)	Unaligned
Australian National University Monash University	Curtin University of Technology RMIT University	Charles Darwin University Flinders University	Central Queensland University Southern Cross University	Australian Catholic University Charles Sturt University
The University of Adelaide The University of New South Wales The University of Melbourne The University of Sydney	University of South Australia University of Technology Sydney Queensland University of Technology ³	Griffith University James Cook University La Trobe University Murdoch University Western Sydney University ⁴	Federation University Australia The University of New England University of Southern Queensland University of the Sunshine Coast	Bond University Deakin University Edith Cowan University Macquarie University Swinburne University of Technology The University of Newcastle ⁵ University of Canberra University of Notre Dame, Australia University of Tasmania University of Wollongong Victoria University

³ Queensland University of Technology is no longer part of the ATN, although we have kept them in there for the purposes of the analysis.

⁴ Western Sydney University only joined the IRU in 2017.

⁵ The University of Newcastle was previously a member of IRU but left the group in 2014.

Appendix B: Methodology

The project adopted a mixed method approach involving: 1) a literature review; and, 2) quantitative analysis of national and international data on higher education performance metrics.

The first stage of the project was a literature review of research concerning performance funding in Australia, the United Kingdom (UK), and the United States (US), to inform historical and international case studies of performance funding schemes. Three international co-investigators – two from the US and one from the UK – were recruited to help us navigate these very different higher education contexts and alert us to ongoing developments in their respective jurisdictions. Given the fact that both the US and UK higher education contexts were in constant flux, particularly with respect to performance funding, this proved to be of great value.

The first stage also involved the collection and analysis of pertinent data which further supported findings from the literature review. Data was collected on the funding outcomes of the Learning and Teaching Performance Fund by transcribing the allocation tables present in the 2006, 2007, 2008, and 2009 Higher Education Reports which were released annually by the Australian Government department responsible for higher education. The funding amounts were then inflated using the Australian Bureau of Statistics (ABS) Consumer Price Index to reflect real prices (i.e. \$2017). Funding was aggregated into categories based on the prevailing Australian university groupings that exist.

Data were also collected on the institutional outcomes of the Teaching Excellence and Student Outcomes Framework (TEF), and the rankings of UK higher education institutions were transcribed from the Academic Ranking of World Universities, QS World University Rankings, and the Times Higher Education World University Rankings, to obtain a UK specific ranking for each. Institutions were excluded from the analysis if they were given a ‘provisional’ rating by the TEF, or if they did not participate in the TEF exercise, resulting in a final sample of 269 institutions. As a result, a large proportion of Scottish and Welsh institutions that chose not to participate in the TEF were excluded, including several that tend to rank highly in conventional rankings, such as the University of Edinburgh. The rankings were then binned for visual salience, with break points being set where there was a discrete cut in rankings. As such, the bins chosen were rankings from ‘1-16’, ‘17-35’, ‘36-100’, and then ‘Unranked’.

The second stage of the project utilised national data alongside international data for benchmarking, to better understand the spread of performance between institutions in commonly used metrics such as success, retention, student experience, completion, and graduate employment. These metrics were identified as common in the literature, and have also been mentioned by the Government as possible metrics used for developing an Australian performance funding scheme. International comparative data were gathered according to whether similar metrics were publicly available.

We were not able to obtain success data for UK or US institutions, so our comparison only includes Australian universities and non-university higher education institutions (NUHEIs). The success rate is the proportion of student load for units of study passed, divided by all units of study attempted. Data limitations meant that we could only get commencing bachelor degree success rates for

universities. A complication is that for NUHEIs, the only available success rate is for commencing undergraduate students which also includes sub-bachelor qualifications such as associate degrees and diplomas. This makes the two sectoral success rates not directly comparable. We decided to persist with the analysis because the comparison in which we were interested was the spread of success rates between institutions in each sector.

The retention metric we used for Australia is the new adjusted retention rate for commencing domestic students, which is the number of students who commenced a course in year (x), and did not complete in year (x) or year (x+1), and still continued to be enrolled in year (x+1), as a proportion of all students who commenced in year (x) and did not complete in year (x) or year (x+1). The new adjusted retention rate also uses the Commonwealth Higher Education Student Support Number (CHESSN) to track students that may have moved between institutions, thus giving a more accurate picture of which students are being retained in higher education. Due to data limitations, for Australian higher education institutions we could only obtain retention rates for bachelor students. We were able to obtain retention data from both the UK and the US. The UK retention data was taken from the Higher Education Statistics Agency non-continuation rates, and full-time and part-time non-continuation rates were summed to calculate a retention rate for the 2015 and 2016 academic year. The US data was taken from the National Center for Education Statistics Integrated Postsecondary Education Data System, where institutions were filtered to include only public and private not-for profit four-year colleges. Filters were also applied to include only domestic students undertaking their first degree. The retention rate is the sum of full-time and part-time retained students divided by all the students who commenced in the previous year.

Student experience data for Australia were taken from the 2017 Student Experience Survey, and included the proportion of positive responses to the quality of the entire educational experience. We also obtained data from the UK National Student Survey (NSS), and exploited a question that asks students if, overall, they are satisfied with the quality of the course.

Finally, we did not use international comparisons for completions and graduate outcomes. Instead we used comparisons between the Australian university and NUHEI sectors, as well as comparing temporal differences between the metrics.

Data analysis was undertaken using the open-source R statistical software. Most of the analysis was undertaken using Hadley Wickham's (2017) 'tidyverse' suite of packages. Graphics were mainly constructed using the 'ggplot2' package (Wickham, 2016), with the exceptions of the alluvial chart which utilised the 'ggalluvial' package (Brunson, 2018), and the correlogram which used the 'corrplot' package (Wei & Simko, 2017).

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