

# Quality, quantity and quintains: what the Commonwealth and others may expect of quantoids

Paper presented to the Australasian Association of Institutional Research 2009 annual forum, Adelaide, 12 November 2009.

Gavin Moodie, Griffith University

I acknowledge the traditional custodians of the land on which we are meeting today, and value the important role Aboriginal and Torres Strait Islander people play within our community.

Thank you for this opportunity to start this morning's discussion of what may be expected over the next little while from Australian universities' quantoids - their institutional statisticians and quantitative analysts. A quintain is a medieval jousting game. The player charges at a target which is mounted on a revolving pole with a counterweight on the other end. Here is picture of a model quintain produced by Schleich (no date) which its web site says 'manufactures action figures and animal toys that inspire imagination with boys and girls around the world'.

Figure 1: a model quintain



Source: Schleich (no date)

Here is quintain illustrated in an engraving from a 15<sup>th</sup> century manuscript.



Source: iStockphoto (2009)

The aim of quintain is to hit the target while avoiding the counter weight at the other end swinging around and hitting you. My point is that the Commonwealth's performance targets may be like a quintain, a medieval jousting game that often as not turns around to whack you in the back of the head when you don't expect it. This is another way of restating Goodhart's law. Charles Goodhart was a chief economic adviser to the Bank of England from 1980 to 1985. He first stated his 'law' as a jocular aside at a conference of the Reserve Bank of Australia in 1975 (Goodhart, 1975). Goodhart's law has been formulated several times, perhaps best by Marilyn Strathern (1997): when a measure becomes a target it ceases to be a good measure. While I support targets and believe the Australian Government is right in setting them, I suggest that we need to be wary that Goodhart's law wont subvert the purpose of the targets.

I will start by reviewing what data collection and analysis may be expected of quantoids in the next few years and conclude by trying to draw some general points. I will close with a reading from the chronicle of St Julia of Lalor.

### **Staff stats**

I understand the Commonwealth is contemplating reviewing the staff data collection, which many will think is long overdue. There are numerous limitations with the current staff data collection and many will have several suggestions for its improvement. I propose 3.

The under representation of women in senior academic appointments, university senior management and to a lesser extent senior general staff positions has been recognised as a problem for decades. There are 2 popular concepts to explain this phenomenon. One explanation is 'the glass ceiling', a term invented in 1979 by Katherine Lawrence and Marianne Schreiber of Hewlett-Packard (Taneja, Pryor and Humphreys, 2009: 21). Another explanation for the underrepresentation of women in senior university posts is the pipeline: that while women have been entering higher education in increasing numbers for over 2 decades they need yet more time to emerge in senior appointments.

These explanations could be tested and perhaps others proposed if there were better data on university staff. For example, it would be useful to know how long each staff member had occupied their current position and had been employed at their current university. It would also be helpful to know at which institution and when staff acquired each of their degrees. Currently it isn't possible to determine how many women are in university senior management without making some judgements and manually counting numbers in Universities Australia's (2009) senior officers report. This is part of the inadequacy of the collection of data on general staff, or 'non-academic' staff as the department still insists on calling us. It should be possible to test claims about the growth in 'administrative' staff.

How many casual staff do Australian universities employ? The increasing casualisation of Australian university staff has been an issue for years, yet this most basic of statistic isn't available. The National Tertiary Education Union tries hard to make reasonable estimates, but it is remarkable that it should have to do so.

The aging academic workforce has been a live issue for a few years and University of Adelaide academic Graeme Hugo has got considerable income doing a bit of basic analysis of universities' staff statistics for them. But, again, the sector is missing some basic data to determine whether it really is facing a significant problem. For example, what proportion of academic staff plan to retire at aged 60 or 65? The only sector data I know of is from surveys of US academics sponsored by the TIAA-CREF Institute, the research foundation sponsored by faculty retirement insurance provider TIAA-CREF (Teachers Insurance and Annuity Association - College Retirement Equities Fund) (Wheeler, 2008). What is the extent of 'unmet demand' for academic staff, shown, for example, by the number of qualified applicants for each post?

### **Students from a low socio economic status background**

Later this year the Department of Education, Employment and Workplace Relations plans to release a discussion paper on the measurement of students' low socio economic status. The department is widely expected to propose reducing the size of the geographic area used to indicate socio economic status from postcode to presumably collection district. This would take a bit of work to establish but would be essentially a refinement of the current method, so conceptually it would be easy to accept. It should make the measurement of low socio economic status more accurate - altho at least 1 study suggests not very much more accurate (Sinclair, Doughney and Palermo, 2003) - and it would allow socio economic status to be ascribed confidently to smaller numbers of students.

The department is also expected to consider changing the measure of low socio economic status to parents' educational attainment, and father's educational attainment might be the most effective parsimonious measure derived from this collection. This is a conceptually different indicator of socio economic status from the current indicator which may take some time to gain acceptance. Additional work will be needed to calibrate the measure and set reference values for low, medium and high socio economic status. However, it may be accurate for very small numbers of students, perhaps even for individuals, which would be a considerable advantage.

If parents' educational attainment is implemented as an indicator of students' socio economic status institutional researchers will dive to the profile of their university's region in the Australian Bureau of Statistics' (2008) *National regional profile*. There they will find that Canberra, Sydney's north shore, Melbourne's eastern suburbs and Brisbane's inner suburbs

have far higher proportions of graduates than other parts of Australia and so argue that their universities are still relieved of changing their practices to improve their proportion of students from a low socio economic status background.

In the meantime the Commonwealth will presumably use the current postcode method to set each institution's low socio economic status target in its institutional compact and possibly in each institution's learning and teaching performance funding formula. I suggest it would be useful for institutional researchers to examine not only their own institution's target but those of other institutions. The different targets set for each type of university will be one indication the government's attitude to institutional differentiation.

Whatever institutional targets are set, I don't expect the sector to meet the government's target that students from a low socio economic status background will be 20% of higher education enrolments by 2020. As I have written elsewhere, I don't expect enough improvement to be gained from the currently announced measures of the low ses enrolment loading which builds up to 4% per equivalent full time student load in 2012-13 and support for universities' partnerships with schools and Tafe institutes.

### **Meeting the government's attainment target**

I expect quantoids will be asked to calculate a number of targets to monitor progress with the government's attainment target to have 40% of 25-34 year olds with a bachelor degree or above by 2025. Each institution will have admission and enrolment targets, presumably several years in advance. These will be nothing new except that since the government's attainment targets is for the number of people with a bachelor degree or above, institutions' admission and enrolment targets will be set in student enrolments, not load. Nonetheless, institutions will want to maintain their student load targets since this is most apposite for calculating teaching load and is the basis for calculating Commonwealth grant scheme and Hecs revenue. So institutions will maintain 2 admission and enrolment targets, one expressed in enrolments and the other in load.

But of course the government's attainment target is best monitored not by institutions' admission and enrolment figures, but by their graduation numbers. Simply monitoring program completions would be adequate in my view, but I gather the department wants to calculate completion rates. It would track students individually by their Commonwealth higher education student support number. The Commonwealth higher education student support number was introduced in 2005 so comprehensive completion rates couldn't be calculated before 6 years' data are available in 2012. For the first time this will generate some useful national data rather than estimates of completion rates. For example, it should be possible to count the completion of students who start at one institution and transfer to another. However, these completion rates will be limited by the limited coverage of Commonwealth higher education student support numbers, a limitation that was pointed out to the Commonwealth at the time the number was introduced.

An intermediate indicator of progress towards program completions might be the attainment rate, which would be the average of an institution's progress rate and retention rate -

$$(1) \quad \text{Attainment rate} = \frac{\text{progress rate} + \text{retention rate}}{2}$$

## **Engagement**

Unfortunately the Commonwealth seems committed to a new measure of student engagement. I regret this because I think the course experience questionnaire is already an adequate measure of student engagement and Australian higher education doesn't need a more complete measure of student engagement so much as even rudimentary measures of academic standards and student attainment. The obvious options are some of the optional scales of the course experience questionnaire, the first year experience questionnaire and an abbreviated Australasian survey of student engagement. I expect the Commonwealth will require universities to survey current rather than completed students, and that its first inclination will be to seek a survey of the whole population rather than a structured sample. This will encounter all of the familiar difficulties of administering the survey and getting a respectable response rate.

## **Institutional learning and teaching performance funding**

The department will set performance targets in learning and teaching for each institution which thus far seem to me to be not much more than converting the indicators for the sector learning and teaching performance fund into targets for each institution. The department is also likely to include targets for attainment and student engagement in each institution's performance formula.

I suggested to the department that it might encourage diversity by allowing each institution to choose the weight that is allocated to each indicator, but this seemed a novel idea which apparently the department hasn't found attractive. Instead it seems that each institution's performance funding will be allocated according to its performance in about 20 indicators. Research performance indicators are reasonably congruent: there is reasonable correlation between institutions' peer-evaluated grants, publications and citations. The indicators in learning and teaching are not so congruent: institutions' performance in some learning and teaching indicators move in a different direction to their performance in other indicators. So in aggregate institutions' performance on their learning and teaching targets aren't likely to change much from year to year, thus muffling any incentive that the performance fund is meant to give.

## **Institution and program standards**

The Australian Government proposes that the new Tertiary Education Quality and Standards Agency will periodically assess each institution against the relevant requirements in the national protocols for higher education approval processes. These are reasonably straightforward for most universities, altho I'm not sure that all universities meet criterion D5 that the university

- D5. delivers AQF higher education qualifications across a range of broad fields of study (including Research Masters and PhDs or equivalent Research Doctorates in at least three broad fields of study) and sets standards for those qualifications which are equivalent to Australian and international standards.

(MCEECDYA, 2006: 10)

Institutions that wish to offer programs to international students will also continue to be required to meet the requirements of the *Education Services for Overseas Students Act 2000* (Cth) and the *National Code of Practice for Registration Authorities and Providers of Education and Training to Overseas Students*.

The new standards agency will also monitor institutions' compliance with the Australian qualifications framework. Last time I looked all universities breached the Australian qualifications framework's requirement that masters degrees be at least 2 years' duration. Even if the Australian Qualifications Framework Council's proposal that the standard length of masters be cut to 1.5 years, most if not all universities would still not comply with the framework.

### **Academic standards**

The Australian Government will want the Tertiary Education Quality and Standards Agency to monitor institutions' maintenance of appropriate academic standards. As is evident from the discussion paper from the Australian Universities Quality Agency on setting and monitoring academic standards for Australian higher education, monitoring academic standards could be very complicated and enormously time consuming. I expect that at least initially the agency will monitor academic standards in 2 ways. First, the agency will essentially delegate standards monitoring to professional associations and registering and licensing bodies which have established appropriate processes for accrediting qualifications. I think the strongest examples in Australia are Engineers Australia and the Australian Medical Council, but the accreditation processes for accountants, architects, dentists and nurses are also probably acceptable as are the processes for several smaller occupations. It shouldn't be too long before there is an acceptable accreditation process for school teachers and other reasonable accreditation processes may be encouraged by TEQSA's approach.

The second approach will be based on the Australian Learning and Teaching Council's (2009) learning and teaching academic standards project. The council says that each discipline community will develop academic standards for each level of qualification. It says that standards will be expressed as learning outcomes that can be measured or assessed. The council's current project is due to run for another 2 years, but I'd be surprised if learning outcomes and appropriate measures will be developed by then.

The European Community's so-called 'Tuning' process may in time provide academic standards against which Australian qualifications may be assessed. The tuning process was developed to build trust in the very different qualifications offered in the 46 countries of the European higher education area so that academic credits may be accumulated, transferred and recognised in the European credit transfer system.

The tuning process identifies for each program in each subject area its objectives and learning outcomes which are expressed as knowledge, understanding, skills and abilities. From that the process identifies general and subject-related competences which students should achieve after completing the program. The Tuning Project (2008) has identified 30 general competences for occupational therapy such as 'capacity for analysis and synthesis' and 'ethical commitment' and 35 subject specific competences such as 'explain the relationship between occupational performance, health and well-being' and 'take a pro active role in the development, improvement and promotion of occupational therapy'. The *Reference points for the design and delivery of degree programmes in occupational therapy* (Tuning Project, 2008) is 212 pages

and would be a good handbook to accredit an occupational therapy program, but it still would require an extensive process to be implemented for each institution.

Another possibility is to assess learning outcomes. We are familiar with the underwhelming results from the Australian Council for Education research' graduate skills assessment. The OECD is trying a somewhat different approach in its feasibility study of the assessment of higher education learning outcomes, which is called colloquially the higher education PISA. The assessment is trialling 4 strands: general skills, discipline competences, learning context and education value added. While this is a worthy development, the OECD (no date) says that a full scale AHELO is unlikely before 2016.

None of these worthy efforts convince me that it is possible to describe educational standards that are publicly verifiable without an external exam, which is unacceptable to universities that they impose them on schools for the purposes of university admission. Educational standards are too complex and the processes for producing them too little understood to be specified by outcomes alone. So I think that in the end Australia will have to overcome its phobia against specifying educational inputs. One could start with something straightforward such as the normal entry requirement for a masters degree (ie, held by 80% of entrants) is a bachelor degree and that the normal entry requirement for a bachelor degree is year 12.

## **Research**

The excellence in research for Australia assessments will rate each university's research on a 4 point scale of quality: international, national, emerging and not competitive. Indicators of research quality such as peer reviewed research grants, ranked journals and citations will be collected in 157 four-digit research groups. Examples of research groups are: 0201 astronomical and space sciences, 0204 condensed matter physics, 0205 optical physics, 0206 quantum physics, 1902 film, television and digital media, 1903 journalism and professional writing, 1904 performing arts and creative writing and 1905 visual arts and crafts. Indicators of research activity such as full time equivalent staff will be collected in 22 two-digit research divisions. Examples of research divisions are: 02 physical sciences, 03 chemical sciences, 04 earth sciences, 19 studies in creative arts and writing, 20 language, communication and culture, 21 history and archaeology, and 22 philosophy and religious studies.

The Australian Research Council will publish the results of its trial assessments of research in the physical, chemical and earth sciences and humanities and creative arts clusters later this year. This will allow analysts to rank institutions by their research rating in research groups such as condensed matter physics, optical physics, quantum physics, etc. It will also allow analysts to rank institutions by their research volume and intensity in research divisions such as physical sciences, chemical sciences, earth sciences, etc.

The Australian Research Council expects to conduct a full excellence in research for Australia assessment in 2010, perhaps reporting results towards the end of that year or early 2011. You will recall that D5 of the national protocols for higher education approval processes require universities to offer research doctorates in at least 3 broad fields of study, and protocol D2 requires universities to 'undertake[s] research that leads to the creation of new knowledge and original creative endeavour at least in those fields in which research masters and PhDs or equivalent research doctorates are offered' (MCEECDYA, 2006: 10).

It will therefore be possible for the Tertiary Education Quality and Standards Agency to determine that no institution may continue to call itself a university unless it has research in at least 3 research divisions (2 digit codes) of a specified volume rated at least of 'emerging' or

'national' quality in the ERA assessment. The Tertiary Education Quality and Standards Agency may further determine that no university should accept any higher degree by research candidate in any research group (4 digit codes) unless its research in that group has been rated to be of 'emerging' or 'national' quality in the ERA assessment.

### **How much does it cost?**

I gather the Australian Government departments of Finance and Treasury are keen to know how much research costs. This is why the Department of Innovation, Industry, Science and Research is requiring universities to conduct studies of what it calls 'transparent costing'. But as my colleague Tony Sheil observes, the Higher Education Funding Council for England couldn't get any useable data from its transparent approach to costing research without also extending it to teaching. So if the central coordinating departments persist with transparent costing universities will be required to survey all activities of at least a structured sample of academics.

### **Accessible information for the public**

No doubt encouraged by the 'success' of its going to uni web site the Commonwealth is proposing to develop what it calls 'publicly available, searchable, multi-dimensional performance data'. This will presumably be a web rating tool like that developed by the Centrum für Hochschulentwicklung (Centre for Higher Education Development - CHE) in 1998. Its well designed web tool (CHE, 2009) is directed to students, allowing them to enter their preferences such as a law program with high teaching evaluations in a university with a strong sports program. The tool shows all the programs that meet the parameters entered by the enquirer, with each program rated in the top, middle or bottom group on each of the criteria chosen by the inquirer. Enquirers can specify up to 22 criteria in seven domains: teaching and learning, learning facilities including library and IT, international orientation, reputation, research and extra curricula.

CHE's example is being followed by the European Commission (2008) which in 2008 invited tenders for designing and testing a new multi-dimensional university ranking system covering institutions in and outside Europe, in particular the US, Asia and Australia. In the first phase until the end of this year the winning consortium is testing its design with stakeholders. In the second phase in the first half of 2010 the consortium will test its design on a representative sample of at least 150 higher education and research institutions, focussing on engineering and business studies. The European Commission is funding this project with €1.1 million, which is about \$Aus 1.8 million. I don't know what amount DEEWR is contemplating investing in its 'publicly available, searchable, multi-dimensional performance data'.

### **University league tables**

Currently most world university league tables base at least some of their ranking on each institution's number of publications and citations indexed either in Thomson Reuters' Web of Science or in Scopus, the publications database of the multi national publishing giant Elsevier. It is therefore important that your university's authors include in their institutional affiliation 'Australian National University', for example, and not just 'ANU', the 'Institute of Advanced Studies' or the 'John Curtin School of Medical Research'.

There has been an additional data collection for the QS-Times Higher Education world university rankings. Recently QS Quacquarelli Symonds and the Times Higher Education announced that they have split and that they will each produce separate league tables from next year. QS Quacquarelli Symonds has arranged for its league table to be published in the

UK *The Sunday Times*, *US News & World Report*, *South China Morning Post*, Korea's *Chosun Ilbo* and other media around the world. Times Higher Education will get its data collection and analysis done by Thomson Reuters, which has recently recruited as its director of research evaluation Jonathan Adams, who was formerly with Evidence Ltd, the UK data analyst. Times Higher Education hasn't said much about its new league table, and indeed is collecting suggestions from readers, but I expect many universities will end up providing data to at least 2 world ranging organisations in 2010 and possibly more thereafter.

### **Some general trends**

So what general trends emerge from this review of future data reporting and analysis requirements? First, it seems clear that the Commonwealth's data requirements will expand overall, despite a few requirements being removed. Data reporting for university league tables will increase, and I expect data collection, reporting and analysis will expand considerably for quality assurance. External data collection and reporting requirements tend to crowd out institutional data collection and analysis, particularly at the smaller universities. If the Commonwealth imposes an engagement survey of the whole student population this will start crowding out institutions' own surveys.

Secondly, there is a growing trend to monitor not just simple statistics but ratios, rates and other statistical constructs. Thus, the Commonwealth expresses interest in measuring education value added, altho that seems a distant hope to me. If the Commonwealth insists on collecting comprehensive costing data from universities it should be possible to calculate expenditure per equivalent full time student load and expenditure per graduate.

Thirdly, there is a growing trend to compare institutions' performance with other institutions both within Australia and overseas. International comparisons require very careful attention to not only other countries' different collection conventions but also to salient differences in higher education in each country. For example, the ACER and the Commonwealth are keen to observe the differences between the outcomes from the Australasian survey of student engagement and the US' national survey of student engagement upon which it is based, without observing that a far higher proportion of US university students live on campus, thus increasing scores on several items in the student survey.

Fourthly, there are several specialisations developing within data collection, reporting and analysis. I don't know how it is done at most universities, but in many of the bigger universities research data is collected and analysed by a specialist group in the research office rather than in the general planning and statistics office. Some universities have the student evaluation of teaching collected, analysed and reported by teaching and learning units. I expect these specialisations to proliferate: whether the specialisations should be organisationally separate from the university's general planning and stats office is a separate question.

Finally, there seems to be a growing trend for what may be called 'informal statistics'. A vice chancellor may ask: which are the fastest growing universities? Do they mean by students, staff, revenue, research or some other measure? If it is students, does the vice chancellor mean student enrolments or load? Just domestic or including international students? Just on shore or all international students. Having answered all these questions the analyst will return a while later with follow up questions such as absolute or percentage growth? Two weeks later the analyst produces an elegant pivot table to 5 decimal places.

This may be exactly what the vice chancellor wants some times. But mostly the vc wants a quick answer without all the clarifying questions preferably within an hour and definitely

within a day. Senior management's statistical requests differ markedly by context and I think an important quantoid skill is identifying the context for various requests and responding accordingly.

Some senior managers seem to be impressed with pretty pictures - simple graphs, tables and dashboards that can be included in powerpoint shows. Unfortunately I see no prospect of this demand falling. Some senior managers want what my colleague Gillian Collum calls 'happy stats'. These are statistics in which the trend is always better, producing graphs which always go up.

You will need to decide for yourself how much you will produce what I have called informal statistics - the quick and dirty, pretty pictures and happy stats. But your noble disinclination to produce informal statistics keeps me in a job, for which I am grateful but which may not be the best use of the university's money. I look forward to you taking over my job soon.

I will close with a reading from the chronicle of St Julia in which she delivers 9 ongoing imperatives in relation to the institutional research agenda going forward.

### **9 ongoing imperatives in relation to the institutional research agenda going forward**

St Julia of Lalor wandered in the western suburban wilderness for 11 long years when she was called into the promised land of Canberra. She went up into Black Mountain and after a planning retreat of 40 days and 40 nites she came down from the mountain and said -

Some before me have given 10 commandments but I give you 9 ongoing imperatives in relation to the institutional research agenda going forward because the education revolution makes us more efficient. The greedy 8 have 12 precepts in terms of excellence because more represents better according to them, but I say to you that all you need are 9 ongoing imperatives going forward. And further I say to you, your institutional compact will require a 1% improvement by 2012 when you shall have 8.1 ongoing imperatives going forward.

1 I constitute the lord your god, who brought you out of the land of the Coalition and into the win-win situation of the evidence-based value proposition. In respect of which, ask not what your government can do for your university, but what your university can do for your government.

2 You shall focus on no other god before me in the religion space. And the orthodox believed and submitted returns to DEEWR their lord god. But the evangelists proclaimed: the reality is that the one and only true god is DIISR. The DEEWR and DIISR believers deployed different business plans and there was great confusion, for DEEWR and DIISR are jealous gods.

3 You shall not utilise an idol, whether in the form of the vice chancellor market that is in heaven above or the registrar cohort that is on the earth beneath.

4 You shall not utilise the almighty dollar in vain but take on board the imperative to deploy strategies to enhance positive outcomes in relation to all stakeholders going forward.

5 For 4 days you shall work and in respect of the fifth you shall take a flex day when you shall not work and keep holy; except that if you are an academic you will keep every day holy and curse any fascist bureaucrat who interrupts your international-quality research.

6 Honour your statistics officer and institutional researcher, so that their days may be long in the cushy job that the lord god is giving them.

7 You shall not kill, even in respect of any dean who still insists that the retention data are wrong because they don't count students who transfer to another program in the university.

8 You shall not adulterate your data, nor steal your superior's thunder nor lie about your neighbour's university.

9 You shall not covet your competitor's budget; you shall not covet your competitor's data warehouse, or male or female staff, or office, or title, or any initiative that gains traction in relation to your competitor.

And St Julia ended, saying: in the name of DEEWR, DIISR and the almighty dollar, may peace be with you going forward.

Gavin Moodie  
10 November 2009

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