

Translating rich learning assessments into certified results and university selection devices



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Dr Matters recently reviewed senior assessment and tertiary entrance processes for the Queensland Government with co-investigator Professor Geoff Masters, culminating in the report, *Redesigning the secondary–tertiary interface*.

Her many other published journal articles, conference papers and books relate to statistical and social moderation, validity and reliability issues associated with test format, test-taking behaviour, criteria- and standards-based assessment, identifying and testing cross-curriculum skills, the alignment of curriculum, pedagogy and assessment, and the management of innovation.

Abstract

There are challenges in designing a set of high-quality processes in senior assessment and tertiary entrance that meet the needs of future senior secondary school students and future users of the certified results of learning assessments. Assessment and selection arrangements should look to the future rather than backwards to arrangements that might have existed in the past or that presently operate, unexamined, in other places. Teachers need to be convinced that the richness of students' learning

assessments will not be lost or transmogrified in any new processes for grading or ranking. A set of principles should guide the design of a new system — a set that gives pre-eminence to, but goes beyond, validity and reliability. This paper introduces the principles that guided deliberations in the recent review of senior assessment and tertiary entrance in Queensland, and describes, in simple terms, the design features of a new system based on the review's recommendations.

Notes to the reader

This short paper incorporates but a small part of the 265-page review report, *Redesigning the secondary–tertiary interface* (Matters & Masters, 2014), available at <http://www.acer.edu.au/queenslandreview>

The terms of reference of the review can be found at [www.acer.edu.au/queenslandreview/Review of Senior Assessment and Reporting and Tertiary Entrance Terms of Reference](http://www.acer.edu.au/queenslandreview/Review%20of%20Senior%20Assessment%20and%20Reporting%20and%20Tertiary%20Entrance%20Terms%20of%20Reference)

The first person ‘we’ in this paper refers to Geoff Masters and Gabrielle Matters, the reviewers.

Until ACER’s 2014 report, the most recent review of tertiary entrance in Queensland had been in 1990.

For those unfamiliar with the Queensland system as it currently operates, a simple description can be found in Paper 1 in Volume 2 of the review report.

Queensland’s system of senior assessment and tertiary entrance, commonly referred to as the ‘OP system’, was established in 1992. The Overall Position (OP) is the primary selection device for Year 12 completers seeking entry to universities in Queensland. It is a rank order from 1 (highest) to 25 based on students’ overall academic achievement as measured by a combination of results across a student’s different subjects.

The ‘OP system’ covers more than tertiary entrance and the OP. The OP exists in the zone between school and university in which selection decisions are made; the OP system covers senior assessment as well as tertiary entrance.

Senior assessment in Queensland is school-based and externally moderated. There are no external examinations. Senior subject results are based exclusively on assessments (typically four to six) devised and marked by teachers in schools with reference to standards set down in subject syllabuses. The moderation model, designed to achieve comparability of standards, is consensus moderation, a form of social moderation that uses expert review panels at district and state levels. Senior subject results are certified as one of five levels of achievement (from Very High Achievement to Very Limited Achievement).

The Queensland Core Skills Test, a cross-curriculum test, is used to enable scaling of subject results in the calculation of OPs. Scaling is necessary before results in different subjects are aggregated because levels of achievement are not comparable across subjects. The Queensland Curriculum and Assessment Authority generates OPs and provides them to the Queensland Tertiary Admissions Centre, a company formed by the universities.

List of acronyms

ACER	Australian Council for Educational Research
ATAR	Australian Tertiary Admission Rank
FP	Field Position
OP	Overall Position
QCAA	Queensland Curriculum and Assessment Authority
QCS	Queensland Core Skills
QTAC	Queensland Tertiary Admissions Centre

The task

In June 2013, the Queensland Government commissioned ACER to conduct a major independent review of Queensland’s senior assessment and tertiary entrance processes. The reviewers were required to consider the effectiveness of the systems and identify ways to improve, revitalise or reform them. The review was also required to consider referrals from a 2014 parliamentary inquiry into assessment methods used in senior mathematics, chemistry and physics in Queensland schools.

Review processes

Key aspects of senior assessment that the ACER reviewers (‘we’) examined were: Comparability, Moderation, Assessment instruments, and exit Levels of Achievement. Key aspects of tertiary entrance that we examined were: Overall Position (OP) and Field Position (FP), the Queensland Tertiary Admissions Centre (QTAC) Selection Rank, the Queensland Core Skills (QCS) Test, and the Australian Tertiary Admission Rank (ATAR).

Thousands of stakeholders and interested parties were involved in the review process: more than 2200 responses to a survey, nearly 100 formal submissions, four significant forums involving almost 300 key stakeholders and interested parties, and approximately 50 meetings of key stakeholders and their constituents with the reviewers. Thus we had many opportunities to gain insights into the way people were thinking about the OP system and to share our deliberations with them.

We made our own observations and undertook our own research, drew on our own knowledge and experience, built theories and tested out our findings with key stakeholder organisations, interested parties, technical experts, and colleagues in Australia and overseas who are influential in the fields of educational assessment, principles and practice and tertiary selection. We also sought counsel from our international consultant, Dr Peter Hill, who is renowned in education circles. We paid particular attention to two pieces of work commissioned for the review: Professor Claire Wyatt-Smith’s research into standards, teacher judgement and the operation of review panels as part of moderation; and Dr Reg Allen’s analysis of the strengths and weaknesses of the OP system today.

Outcomes of the review process

We identified three general areas in which we believe change is required in senior assessment processes for subjects approved by the Queensland Curriculum and Assessment Authority¹ (QCAA) that can count towards tertiary selection indices:

- assessment activities
- assessing student performance
- moderation.

We identified three general areas in which we believe change is required in tertiary selection processes for Year 12 completers:

- use of a single rank order (OP, ATAR)
- separation of responsibilities for certification and selection
- transparency of procedures to those most affected by them.

We concluded that the current OP system, which has served Queensland well for more than 20 years, no longer functions as originally intended and is reaching the end of its usefulness. We recommended that it be retired and the secondary–tertiary interface redesigned.

The centrepiece of a redesigned system is a new Subject Result. We envisage that schools, through the QCAA, would produce valid, reliable, credible, stand-alone Subject Results for certification purposes on a fine scale (possibly 60 points) in place of five levels of achievement (Very High Achievement to Very Limited Achievement), and universities would use those results in fair, transparent and efficient ways as the basis for selecting students into their courses — most likely in the form of an ATAR.

As well as continuing to manage the processes for receiving and processing applications for the majority of undergraduate courses at Queensland universities, the QTAC would also devise any indicators required by the universities (such as an ATAR). In other words, the universities would no longer expect the school sector to rank their applicants for them.

Although we documented the weaknesses in an ATAR we understand why universities are committed to it — a national scale and an administratively simple selection procedure. Nevertheless, a 2000-point scale is untenable as that level of precision is not supported by the nature of the input data.

Furthermore, any rank ordering of students (OP, ATAR) is going to progressively break down over the next 15 years or so, as the basis on which rank ordering is built breaks down (for example, single cohorts of students all finishing their studies together as a group) and as the curiously Australian practice of aggregating scaled subject results is challenged. It is at the national level that the related discussion should occur.

For now, we recommended the introduction of prerequisites for high-demand courses, a reduction in the

number of subjects that count towards a rank order, and a method for incorporating vocational education and training and other learnings into the calculation of rank orders.

Much of the rich information about student learning that is presently captured in school assessments is lost because of the coarseness of the reporting scale. There is a price to be paid, however, for a finer scale (say 60 points) — validity and reliability have to be enhanced. And so the proposed new design includes a prescribed assessment package, a simpler mechanism for marking student work, a revamped moderation model, and the addition of an external assessment (up to 50 per cent of the Subject Result).

A later section in this paper, ‘Underpinning principles’, relates our deliberations to recommendations.

Report to government

An interim report was provided to the state Minister for Education, Training and Employment in May 2014, a draft of the report uploaded to the ACER website in September 2014, and the final report submitted to the Minister in October 2014. There are 23 recommendations: seven on tertiary entrance, eleven on senior assessment and reporting, and five on implementation.

Government response

In January 2015, the Queensland Government released its draft response to the review report. The draft response provided in-principle support for a number of key proposals outlined in the review including the retirement of the current OP system. The draft government response was then subjected to further consultation with key education stakeholders and the broader Queensland community. Consultation continued until the end of March 2015 via an online survey and written submissions. The results of consultation will inform the development of a final Queensland Government response for release in mid-2015. There was a state election at the end of January 2015, which resulted in a change of government.

That the system’s weaknesses have been identified means that change is important and necessary. The nature of the weaknesses and the fact that those weaknesses are now in the public domain means that change cannot be delayed.

Observations and comments

In this short paper it is not possible to present findings formally. A collection of comments and observations is presented in Table 1. Even though the issues are interrelated, the comments and observations are presented in clusters. By the very nature of a review, critical comments prevail rather than comments about the strengths of the present system.

¹ There are many other curriculum offerings but it is Authority subjects that count in the calculation of OPs. Elsewhere they would be recognised as tertiary entrance subjects.

Table 1 Observations of existing Queensland tertiary entrance system

About the OP system

Little or no support either among schools or universities for the OP system

Different expressions of concern between and within the secondary and tertiary systems

OP not aligned with the more diverse ways of completing senior secondary studies

Almost half of Year 12 applicants are judged on criteria other than the OP; most notably a ranking of OP-ineligible students that does not take account of differences in subject difficulty or subject-group enrolments, thus creating an unfair binary system

Lack of understanding of all aspects of the system by people at all levels of the secondary and tertiary sectors and the wider education community

Anecdotes and perceptions abound

Gaming by schools – for example, encouraging students to become ineligible for an OP, manipulating Subject Achievement Indicators, in the mistaken belief that gaming works in the ways intended

Schools use OP results for marketing purposes

Discrimination

OPs in 25 bands do not differentiate among applicants to high-demand courses so universities seek a finer scale

Field Positions (up to five) are no longer useful in discriminating between students with the same OP

There are only five grades for individual QCS results; not useful in discriminating between students with the same OP, especially at the top where it is needed

The finer scale that the majority of universities desire is the national scale, an ATAR (30.00 to 99.95 in intervals of .05)

The level of precision in an ATAR is not supported by the nature of the input data

Rankings (such as OP and ATAR) are administratively simple for universities and QTAC

Lack of transparency in selection

The original model of step-wise decision-making for selecting students (Overall Position, Filed Position, QCS grade, Level of Achievement, other admissible information) has changed on an ad hoc basis to include QCS percentiles and an ATAR (schools and students generally do not know this)

The Queensland Curriculum and Assessment Authority's calculation of an ATAR is based on data not generated for that purpose

Universities

Demand-driven system means that hardly anybody misses out (less than 1.6 per cent of Year 12 applicants – a few hundred out of tens of thousands)

Same ranking for students for all courses – but ranking is really only needed for high-demand courses to break ties between applicants

Prerequisites are worth considering for high-demand courses (for example, taking highest-level mathematics subjects in secondary school to apply for engineering degrees at universities)

OP is based on any combination of five Authority subjects out of approximately 50 subjects on offer – combinations can affect the rank order

ATAR was an unknown species to the school sector before the review

Table 1 Observations of existing Queensland tertiary entrance system (Continued)

Senior assessment
Strong support for school-based assessment, albeit if revitalised
Erosion of the moderation system over the past decade
Problems with current operational model of consensus moderation (review panels)
Frustration about the standards matrix as the tool for making judgements about standard of student work
Large amount of teachers' time used for end-of-year procedures such as assigning SAs and provision of verification submissions to district panels
Uneven quality in teacher-devised assessments — quality ranges from very sophisticated to very ordinary
Some parents frustrated by management of assessment programs in some schools
Some concern that there are too many assessments requiring completion outside school time

Queensland Core Skills Test
Unhelpful status of the QCS Test as the major external examination and key assessment event during the senior secondary years
Role of QCS Test in scaling is not understood
The lack of understanding of scaling is often accompanied by misplaced confidence in that person's understanding
Excessive test practice in schools and funds wasted on external coaching
The QCS Test, one of the instruments for ensuring fairness, is dismissed as not being fair
The secondary role of the QCS Test in producing individual results of achievement in cross-curriculum skills has become less well known at a time when there is world-wide interest in identifying 21st-century skills
Idea of assessing key cross-curriculum capabilities was rejected by key stakeholders.
Some welcomed the discontinuation of the QCS Test that would accompany the replacement of the OP with an ATAR without realising that some form of scaling would still be necessary (we recommended inter-subject scaling)

Underpinning principles

Before we started our investigation we established the principles that would underpin our deliberations. At each stage of our thinking we reconciled our proposals against those principles.

Principle 1 – Validity, reliability, utility

Assessments of student attainment must provide valid, reliable and meaningful information² about what individuals know, understand and can do, and how well, upon completion of Year 12.

Implications of Principle 1

- The purpose of certification is to confirm publicly students' attainment levels upon completion of Year 12.

- Assessments of student attainment should be recorded on certificates in a form that is meaningful to students, their parents and schools, and useful to universities, employers and other users.
- Indicators of student attainment must be appropriate to a range of curriculum intentions, accurate and comparable across schools.
- Assessments of student attainment should stand alone and be independent of how they might subsequently be used.

² Assessment processes are valid to the extent they provide information about the range of knowledge, skills and attributes identified in the senior curriculum. Assessment processes are reliable to the extent they provide accurate information about students' levels of achievement comparable across students and schools.

It is also desirable that senior secondary assessment processes:

- promote high-quality teaching and learning in the senior secondary school, recognise the centrality of learning and reject anything that detracts from student learning
- have a futures orientation — assessment systems with a futures orientation are appropriate to the 21st century; recognise that curriculum priorities are changing; recognise that ways of assessment and learning are changing (responding to the role of technologies in teaching and learning); look to the future not the past; and are able to adapt speedily to changing circumstances
- are fair — that is, objective in the sense of not depending on who is doing the assessing.

Recommendations to enhance validity, reliability

1. Maintain and revitalise school-based assessment.
2. Add an external assessment (at least in some subjects).
3. Prescribe types of assessments to be undertaken and the conditions under which these assessments will occur.
4. Add results of school assessments and an external assessment to give an overall result for certification. However, the school assessment would not be statistically moderated against the external assessment.
5. Devise a new moderation model that involves endorsement of assessments before they are undertaken and confirms the attainment levels (marks) of students on those assessments, one at a time, over the course of study.

Recommendations to enhance usability

6. Devise a new way of describing performance against criteria, which is useful for arriving at Subject Results and for communicating those results to users.
7. Certify Subject Results on a finer scale (than at present) — say 60 points.

Principle 2 — Separation of responsibilities for senior certification and tertiary selection

Universities should take complete responsibility not only for deciding how their future students are to be selected (from the pool of Year 12 completers who seek admission) but also for developing any indicators they wish to use themselves or through their agent, QTAC.

Decisions about university selection — including decisions about course prerequisites, the evidence used in admission decisions and how that evidence is

combined or weighted — are properly the responsibility of the universities. Universities remain free to use a range of evidence in selecting students for their courses. This evidence might include — but is not limited to — Year 12 results provided by QCAA (subject-specific and/or cross-curriculum), orders of merit based on overall achievement in senior studies and/or achievement in specific fields of study, special tests (such as tests of general ability), course-specific university entrance tests, interviews, portfolios, viva voce, lotteries, and the application of prerequisites for high-demand courses.

Implications of Principle 2

- Universities, as is their right, should continue to be responsible for deciding how their future students are selected, including by managing fair competition, where necessary, for high-demand courses.
- If universities choose to combine available evidence in some way, such as aggregating, scaling or weighting, then those processes are properly the responsibility of the universities themselves, not QCAA and the school sector.

Recommendations for separating certification and selection

8. QCAA should be responsible for the certification of student attainment at the end of Year 12 based on valid and reliable assessments but not for the calculation of rankings or other indicators that the universities might require.
9. Universities, through QTAC, should be responsible for comparing and ranking applicants from Year 12 to courses and for undertaking any associated scaling processes or other computations.

Principle 3 — Transparency, fairness

Processes for assessing student attainment in the secondary school and for selecting students for admission to universities should be as transparent as possible to students, parents and schools. Transparency is essential to fairness in assessment and selection processes.

Implications of Principle 3

- In addition to understanding how their achievements will be assessed and the criteria used to evaluate the quality of their work and performances, students should understand how their assessment results are combined to produce an overall result in each subject.
- Universities should make as transparent as possible the evidence to be used in course admission decisions, including processes for the selection of Year 12 completers who are ineligible for a tertiary entrance rank and for discriminating between eligible students when other measures have been exhausted, the use of bonus points, and offering places in advance based on school evidence or recommendation.

Consequential recommendations, in summary

10. Government should make legislative changes to divest QCAA of responsibilities relating to tertiary selection — Subject Achievement Indicators, QCS testing, QCS scaling parameters, generation of OPs and FPs, and other ad hoc measures such as QCS percentiles and an ATAR.
11. Universities should enhance technical capacity within QTAC to undertake any new scaling procedures for producing rank orders or deriving any other indicators that universities require.
12. Universities should review their admissions processes and consider options for comparing and selecting students. The review should consider the appropriateness of constructing a single rank order of Year 12 completers regardless of the course or institution to which they are applying, and options, apart from ATAR, for ranking course applicants.

Note for readers of the full report

There is no one-to-one relationship between the recommendations embedded in the discussion above and the formal list of 23 in the review report. Also, recommendations that appear in the review report on implementation, communication and governance are not discussed in this paper.

What was and what could be

Features of the proposed redesigned system juxtaposed with features of the existing system are in the diagram attached to this paper. Figure 1 illustrates what our proposed redesigned system would mean in practice if it were to be implemented: new Subject Results, new assessment package, new school assessment, new external assessment, new marking schemes for school assessments, new moderation model for school assessments, new certification, new tertiary entrance procedures, and new responsibilities ... in new times.

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Figure 1 Redesigning the secondary–tertiary interface: Proposed new architecture (Matters & Masters, 2014)

