

Submission to

Queensland Review of Senior Assessment and Tertiary Entrance Processes

by

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Work Experience

School Teacher 1982-3. Blackheath and Thornburgh Colleges, Charters Towers.

Experimental and Research Scientist 1984-88, 1991-2. Australian Institute of Marine Science.

University Academic: 1989-91, 1992- present

Research Interests: Environmental Physics, Electromagnetics, Geophysics. 60 publications in international journals including one book.

Engineering and Science Consulting: University Environmental Physics Consulting Unit. Grossed over \$4M in the last 5 years.

Education experience: Registered School Teacher. University lecturer specialising in electromagnetics, oceanography, and the teaching of physics to students with substandard mathematics backgrounds.

Personal background influence: all of my secondary education was in Queensland (Innisfail SHS). The standards and rigour of maths and numerical science was very high. It is painful to see how far down our school system has dropped; according to a recent report, in the '70's we were the best State in Australia, now we are the worst. I have also had to watch my children and their friends suffer under the appalling assessment regime mandated by the QSA. Despite having a keen interest in high school education as part of my duties as a university educator, in the end it was watching my children suffer that galvanised me to help raise awareness of the shortcomings of the QSA which resulted in the EIC inquiry into assessment.

General.

In many regards the review currently being done by ACER covers much of the same ground already covered by the EIC inquiry into assessment in maths, physics and chemistry, the submissions to which clearly demonstrate that the present system of internal assessment being used in Queensland is open to cheating, is incomprehensible to teachers parents and students, and tests the wrong skills in maths physics and chemistry.

ACER must not ignore the findings of the EIC inquiry, or the large number of submissions to the inquiry indicating that the internal assessment systems used by the QSA are unreliable and invalid.

It is also clear that Queensland's present assessment scheme is radically different from virtually any other jurisdiction in the world, and boils down to a failed forty year experiment on Queensland children. The world is not following Queensland's example and we must reform our assessment systems to become similar to those of other major Australian States, or better still, higher performing jurisdictions overseas.

Above all, whatever system is proposed, it must not be yet another experiment.

1. School-based assessment

School based assessment should remain but should be modified to take account the finding of the EIC inquiry into maths, physics and chemistry assessment. This should include the following

- For the quantitative disciplines there should be minimal emphasis on long written tasks. The ability to solve numerical and algebraic problems should be the focus. The numerical sciences are by definition about numbers, calculation, and algebraic equations etc.
- The great majority of assessment should be under strictly invigilated conditions. The present system is far too open to cheating. The students must not be made aware of the questions prior to the exam.
- School based assessment should be scaled by the external exam. The consistency of the internal assessment relative to the external exam should be a primary function of the QCAA to ensure that the internal assessment was not changing the rank order of the students excessively.

2. External assessment

By external assessment, I interpret this as an external exam, although I worry this is not the definition being used by ACER. External assessment should be the primary assessment tool and should be used to scale the internal assessment. For maths, physics and chemistry, the external assessment should be similar to the type of assessment that will be found in first year university courses, i.e. problem solving using pen and paper.

There should be no penny pinching with these external exams. They represent the final output of 12 years of education at a cost of well over \$100K per student. The cost of marking an exam script is insignificant compared with this investment and considering that the final result is what these 12 years are building up to. It makes no sense to save a few cents on the external exam by using an inferior

methodology. In the context of this debate, there have been many statements made, including by the QSA, that external exams are too expensive. This is furphy put around by those educationists who are philosophically opposed to external exams.

Online tests can be used *as a component* of the external exams but must be not used as a complete substitute for a traditional pen and paper exam, especially if this is done as a cost saving measure. Online exams can do some things better than traditional exams. Care would need to be taken to eliminate cheating during online exams. I am not convinced that this can be done but remain open minded.

The student's external exam result MUST be part of the Queensland Certificate of Education so that universities can use this information in their deliberations about entrance to specific courses, i.e the external exam must be quoted separate from the internal assessment result, or the overall result.

Finally, the student' external exam result must be reported as a percentage, and the percentage should be determined by adding numerical marks. The present system of criteria based assessment, where a sequence of letter grades are awarded followed by a holistic judgement (a system otherwise known as guesswork), cannot be used. It is a discredited system. The present structure that subdivides maths physics and chemistry into rather artificial subsections has the effect (deliberately) to down play the importance of technical skill and ability. These are the tools of maths, physics and chemistry and must be heavily emphasised.

3. Moderation

The role of moderation panels could be greatly reduced if the external exam was used to scale the internal assessment. This will represent a major cost saving.

Under the present system, the moderation panels have not been a success.

4. Finer scale for school assessments

The final results for each subject could be represented as a percentage in addition to a rank order of the students in the state (i.e. a statement that a particular student is in the top x^{th} percentile for physics etc)

5. Cross-curriculum capabilities testing

For success in engineering at university, the student's ability at maths is of overwhelming importance. The cross curriculum capabilities are more or less irrelevant. We should not dwell on these considering the much larger problems we have with internal assessment.

6. Separation of responsibilities at the secondary-tertiary interface

Although the present practice is to use the OP score as the primary tool for university entrance, in fact the OP is of limited value in predicting university success in engineering maths and physics. It would be better for universities to use a reliable external exam result for the relevant subjects such as maths B, maths C and physics. However that statement presumes that the subject syllabi are clear and unambiguous. Care will also need to be taken to ensure that the Australian Curriculum syllabi define the word 'Content' in a normal way, not as presently given.

7. Scaling and the construction of rank orders

See comment above. A rank order for each subject would be most useful provided it was determined using primarily a reliable external exam

8. Governance

The predecessor of the QCAA (the QSA) was responsible for the present debacle in Queensland school assessment techniques. If the QCAA is just a rebadged version of the QSA, we can expect major problems in the future. The external exams could be corrupted by the present emphasis of assessment against criteria rather than simply trying to produce a rank order of students. Numerical marks which are now effectively banned should be re-introduced in any reformed assessment system. But the present QCAA personnel are likely to oppose any such reform.

On this subject it is interesting that the UK education minister Michael Gove has called the education bureaucracy "The Blob" because these bureaucracies (of which ACER could be considered a part) tend to smother any reforms that are advocated by politicians (who represent the people). The result is that the failed ideology of the educationists can remain dominant in the education system rather than the wishes of the parents and community. I realise that this comment is offensive to some of those in ACER, but ACER must accept that in some quarters the credibility of The Blob, rightly or wrongly, is very low. There is a growing realisation in political circles that education experts, far from having the solution to our problems, have contributed to many of them.

I hope that the review documents that are ultimately produced by ACER do not demonstrate this yet again.

Yours faithfully

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