May 10th, 2013

The Education and Innovation Committee, Parliament House Brisbane Qld 4000

To the committee secretary,

I have examined the methods of Senior assessment pertaining to maths and sciences in year 11 & 12 which are available online to the public and I believe that they are flawed and, worse, potentially harmful. I will explain how I came to this conclusion based on the term of reference three - the ability of this system to support validity and reliability. I have heard evidence that the same/similar methods being used on younger children at school with inquiry-based learning of too much detail. The requirement for excessive conscious cognitive processing is distracting and distressing and seems to be taking the place of learning and thorough testing of the necessary basics, made worse by vague marking.

Please recommend at the conclusion of this inquiry that all teachers be immediately instructed to:

- return to using numerical marking of science and mathematical-based subjects by the end of this year, and,

- that syllabus guides focus on the **subject** content only, instead of the **behaviour** of the child, as already advised in a QSA-commissioned review in 2006 by the Australian Council for Educational Research .¹

It is not reliable and not valid

1. The marking system used by this state can be seen in parliamentary briefings to have no repeatable, consistent method for markers to come to the same grade reliably. So it is not reliable.

2. As for the assignments or projects, they are plainly invalid. They are not measuring the guts of the subjects, just by even a short perusal of the criteria used to judge them. It seems that 'how' students explain their correct mathematical answers, or formulae or calculations in chemistry or physics, will easily lead them to be marked down to as low as a C or even D. This can be seen by reading the subjective, ambiguous paragraphs inside the boxes of the grids that teachers must follow. This is not validly marking the content of the subject. It is instead measuring to some extent, their behaviour – a psychological area.

Inquiry-based learning assignment (a considerable approach of the QSA) is invalid

The QSA (the curriculum and assessment body of Qld), in defending on 7th March briefing (available to the public online). said that it stands by inquiry-based learning as the basis for its assessment system, unlike other states that have yardstick common statewide exams. Even if the QSA insist on this limited method, people who have studied education or child development, as I have, know that "the proximal zone of learning", an important principle of this inquiry based learning, is not being used by the QSA exemplars. It is when students are given tasks that are challenging but just within their reach. The QSA has

¹ ACER, Matters G (2006) Assessment approaches in Queensland Senior science syllabuses: a report to the Queensland Studies Authority. *Australian Council for Educational Research*. p 40. Quote: "...standards descriptors be re-written to refer to the features of student work <u>rather than to the behaviours of the students</u>."

unreasonably difficult project exemplars, as described by witnesses at this inquiry and submissions published so far.

Assignments in maths and hard sciences are invalid. Students should not be made to research or write sophisticated topics instead of being taught and tested on the basics first. It is impossible to verify the assignments that would come in. Tutors could skill students up with extra research resources that they could use in class, **even** under supervised conditions. The only way to test the knowledge that should have been taught in class, is to give teachers time to teach (not supervised googling of projects) and to test that knowledge under strict exam conditions. Hence, this assignment approach is invalid in this way also. The QSA has already been advised to avoid them for high-stakes final grades by the Australian Council for Educational Research. ²Further reasons and evidence for my disappointment with this system are given below.

Equity for students

Children would rather participate in a system that is equitable. My wish as a professional working with children is that this system is, not tinkered with but rather, completely refocused on the subject content. Broadly, this also comes under the term of reference two – student participation. However, students have no choice to participate in subjects if their parents expect them to attend school and are indeed required to school completion unless able to find work. More importantly, for the sake of all children, whether in public or private education, a valid and reliable approach must be put in its place as soon as possible.

I would kindly suggest an evidence-based assessment system that adheres to the principles of educational and psychological testing standards. Such standards are followed by assessment and education professionals in other states and all around the world. *The Standards for Educational and Psychological Testing*³ is a set of testing standards developed jointly by the <u>American Educational Research Association</u> (AERA), <u>American Psychological Association</u> (APA), and the National Council on Measurement in Education (NCME). From these, professionals who interact with children (in Australia, any minors under 18 years of age, which includes high school students) have specific ethical requirements. From there, the similarly derived "Code of Ethics" by Australian Psychological Society, ⁴ make quite clear the ethical obligations when testing children.. Adhering to these standards would make the school assessment system more valid in refining the goals of assessment, as well as more ethical.

The non-numerical marking is not adhering to ethical standards of testing students at all. These so-called 'standards'-based letter-marking that our Queensland assessment body uses (the QSA) is very much in question. Firstly, it marks students with very course-grained Ds and Cs for perfectly correct answers just because the QSA deems the questions too simple or routine. Then, to rub salt in the wounds, those 'bad' letters do accumulate on a child's profile and lead to the corresponding failure-end of the scale used for the final grade (A-E), which is reported to parents. This flawed method is admitted by the QSA in its briefing paper on 20th March to parliament (p14-15).

(http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/bp-

² ACER, Matters G (2006) above. Task-based assessment be "not mandated until its feasibility , validity and reliability have been demonstrated."

³ AERA, APA & NCME. (2007, current at 2013). Standards for Educational and Psychological Testing http://www.apa.org/science/programs/testing/standards.aspx Quote: "This book is a vitally important reference for professional test developers, sponsors, publishers, users, policymakers..."

⁴ Australian Psychological Society (2007) *Code of ethics*. Melbourne, Vic: Author <u>http://www.psychology.org.au/Assets/Files/APS-Code-of-Ethics.pd</u>

<u>20Mar2013.pdf</u>)

This, then, obviously marks students with a scheme that would tear down their confidence instead of building it up. This is invalid and unreliable as it marks the wrong things and in a very wrong and distracting way.

Need to do no harm to students

It is imperative that these questionable methods in schools are ceased as soon as possible – not after a lengthy review following this inquiry. Otherwise, it is apparent even to the layperson, that they would potentially demoralise students in an invalid and invasive assessment of their behaviours. It is apparent that when students are asked to give answers to the cut-and-dried maths and science subjects, such vague and sophisticated responses, the danger is that they are being measured on their behaviours instead of the content of those subjects. This goes against the general principles of any procedure that involves professional interactions with, and testing of, children.

Here is a reference for the unusual 'standards' that students are tested on, for eg, QSA (2008) Senior Mathematics Syllabus Accessed June 1st, 2012 http://www.qsa.qld.edu.au/downloads/senior/snr_maths_b_08_syll.pdf Note in the syllabus document (which includes assessment directions for teachers that they must follow due to policy)

1. ballooning assessment requirements begin on page 24 and include discretionary 'selective updating' on p 26 (instead of reproducible analytical combination of marks from a year or two's worth of tests, teachers are allowed, even directed, to 'cherry-pick' the results they put towards the final 'exit grade' of your child at end of two years of hard slog at continuous assignments in years 11 & 12),

2. expect teachers to set mandatory 'extended tasks' and 'reports' (p 29), and,

3. the overwhelming yet subjective holistic testing of student **behaviours** in rubrics (p 36), such as "appropriate interpretation" and "coherent justification", the result being that the mathematical topics of the discipline are sub-ordinated.

How can that be measured objectively? With the current flawed system, it is up to how the teacher believes the child is behaving or writing in English to justify their answers. This is completely different to the rock-solid exam papers and answer sheets provided to teachers in NSW or Victoria, for example.

Mathematics (and the hard sciences of physics and chemistry are, almost completely, explained in a language of their own. A single problem may consist of concepts and calculations that go down two pages of A4 size pages. If the child gets all the workings and the final answer correct, they should get full marks and these should add up, with other grades. Only the, it makes sense to be awarded an A grade. There is no need to introduce these waffly, subjective criteria and their emotive-laden letter-scores *during the process of marking*. The calculations themselves have explained whether the student interpreted or justified an answer correctly or partly correct (hence part-marks.) Yet, the QSA actively forbids the use of numerical marking or part-marking.

This avoidance of numerical marking is clearly stated in documents that can be seen online and available to the public through the Queensland Studies Authority website.

Final recommendation

There are many reasons above that invalidate this approach to marking students' work in Queensland, particularly in the cut-and-dried subjects of maths and science. I conclude that this system should be abandoned as soon as possible in favour of valid statewide common exams that need only be at the end of year (or at the end of Year 12 in the least).

Importantly, the current marking system does not appear to be ethical in its treatment of children, nor is it reliable, thus diminishing the worth of the invasive behaviour-judging procedures it bases its standards on. The teachers should actually be asked to mark all projects and tests with number scores so that children of course can see what was wrong and what was right. They should be added up and the total of each test and task should be clearly visible. It may not be perfect but it would be clear and more reliable. Common sense dictates that the marking system has to clear. It is after this is done, that a parent and teacher can discuss the merits or otherwise of the design of the test. At present, this is impossible because the results are not clear in the first instance.

I must add here that under the terms of reference, everything I have seen so far about this system shows it is a very invalid and unreliable system. However, I particularly stress again here that the demoralising effect of using letters to mark down students work when they are getting correct answers appears to be the most disturbing part of this so called system. I fail to see how this can do anything but discourage students . It would be particularly demoralising to students who are just getting things half correct. In the traditional but correct system that the QSA has rejected, their efforts should be given part marks – with numbers – and then added up. This was done before and is still done in other states. As a matter of urgency, I recommend that this straightforward, logical and objective marking be mandated for teachers at the end of this inquiry.

Importantly also, students should have more time to do routine homework and study for their exams. This would necessitate removing the lengthy assignments. Indeed, for such subjects, it would be a good idea. Testing students in English essays and research skills is not a valid method of assessing the fundamental knowledge of maths and sciences. I believe that assignments should be worth very, very little and such a percentage should be clearly stated at the outset (the beginning of each school year). In mathematics I believe there should be no assignments whatsoever.

Statewide exams are preferable to the social moderation process described by the QSA at their briefings. 4000 teachers running around marking other schools' papers is no substitute for statistically collated and callibrated results for children. I trust studies in human health that have strictly collected data.

Statewide common benchmark exams do not have to be 'high stakes'. They don't have to be 100% of the grade and indeed they never are in other state where they are used all the time. They can be used to give a weighted total, which in turn can contribute to a fraction of the final grade or more (such as 50% in NSW; Victoria has more percentage weighting, and very rigorous exams also, see examples in footnote)⁵. Internal tests and

⁵ NSW external exams <u>http://www.boardofstudies.nsw.edu.au/hsc_exams/hsc2011exams/</u>

VIC physics and chemistry exam models can be downloaded from the Victorian assessment website ⁵ NSW external exams <u>http://www.boardofstudies.nsw.edu.au/hsc_exams/hsc2011exams/</u>

VIC physics and chemistry exam models can be downloaded from the Victorian assessment website <u>http://www.vcaa.vic.edu.au/Documents/vce/physics/physics-specs-samp-w.pdf</u> http://www.vcaa.vic.edu.au/Documents/vce/chemistry/chem-specs-samp-w.pdf

quizzes conducted by the teacher in schools can then be recalibrated around the state on the basis of the statewide results. Examples of this are in all other states around Australia.

I think this is sensible. Teachers can get on with teaching, and they are relieved of designing at least one exam at the end of the year. Instead of reinventing the wheel in each school, their exams are written by a body of experts in the subject, efforts are scaled against other teachers' efforts in other parts of the state, bringing transparency and accountability to the system. I must confess, after working in education and social services outside of Queensland, I was shocked to find out that Queensland is the only state without any subject-specific exams. I would think that for the good of society, that all students going to university to become engineers or doctors, for example, or wishing for fair ranking before applying for jobs, should have rigorous knowledge in each of the appropriate subjects that will underlie their professions. Even if they do not apply for university, students would surely like to know how they are going in a reliable way. Thank you for this opportunity.

Yours sincerely,

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* I ask that my email address and my above contact details be 'withheld'- you may publish my name