SMC&PA Submission 171
Received 12 May 2013

To: The Parliamentary Education and Innovation Committee
eic@parliament.qld.gov.au

Date:

I ask that my name, all contact details and the name of school are all withheld (Please check body of text and final signature).

Summary:

My view is that the assessment processes described in the Maths Chemistry and Physics syllabi are invalid and unreliable. They are not supported by teachers and are causing students to drop out of these important subjects.

About me:

I have taught Mathematics for 27 years in both State and Independent Schools. I have a Bachelor of Education and a Diploma of Teaching. I am currently teaching at a [redacted] – [redacted]

Main observations

1. Dumbing down of academic standards
   - I have witnessed the drop in mathematics ability of high school graduates in Queensland over the last twenty years.
   - My current school has the highest academic standards of any school in Queensland and some of the best in Australia. Even so, the standards in Maths that our students are achieving are dropping.
   - We are only able to appear successful because of the flawed system. We have the Queensland Core Skills Test (QCST) preparation down to a fine art and consequently we achieve a high proportion of A's and B's and very few if any D's and E's. Our group averages are high which places our students ahead of most others in the state.
   - We have students getting OP's that can be 2-4 points above equivalent students in other schools. This, just because we can eliminate our tail in the QCS tests. -pretend external exams-. Some students get into University courses that they cannot handle because of the inflated OP (Overall Position). Hardly an equitable approach.

2. Queensland's backward mathematics assessment de-emphasizes content and is unnecessarily complex
   - Compared to other countries where education is valued and where evidence backed by data is the only reason to change how Mathematics is taught. Where knowledge of content is very

important and where assessment is simple, rigorous, equitable, easily administered and understood, the mathematics standard of school leavers in Queensland is at least two years behind.

- Nowhere in Australia or Overseas is there an assessment system like ours. It has been looked at by the other States and found wanting. They could have adopted the Queensland system but chose to stay with their own methods of assessment which include some external assessment (content specific) combined with school based results.
- The other States use numerical marking and not complicated criteria grids to allocate a letter which means something different to each teacher let alone each school. **Can we please go back to using numbers and percentages and an external state wide exam.**

3. Others have rejected Queensland's assessment methods

* Other countries eg Scotland have studied the Queensland system and found it lacking in many aspects.

If this system is as good as the Queensland Studies Authority (QSA) would have us believe, why isn't this approach adopted in other places?

- In the countries where a very similar system was tried, it only lasted a short number of years and was then discredited and replaced. See comments by Pat Whalen's comments in submission number 19 on the failed Washington system, 2006. [1]
- Similarly, the UK has reduced coursework (internal assignments), with pre-university mathematics having zero coursework, in pre-university (GCE A-level) school courses. (QCA UK, 2005, A Review of GCE and GCSE Coursework Arrangements, page 8.) The UK curriculum board was closed and replaced with a new testing agency.[2]
- Why are we not adopting an assessment system that truly has the data to prove its worth? The QSA has had more than enough time to produce results that put QLD at the top. They have failed and they should no longer be making these important decisions. **We need an assessment system designed by the people in classrooms and universities that is clear, fair and which values content. NSW VIC and WA have assessment systems that we could adopt.**

4. Qld High School students lack basic numeracy skills
   - When I teach high school students I find that they lack basic numeracy. Fractions are rarely understood. They lack the ability to do algebra, add fractions, and seem unable to grasp the fact that they

[1] (http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/submissions/019.pdf).

[2] (https://www.gov.uk/government/news/standards-and-testing-agency)

need to learn mathematics rules and procedures if they are to have any chance in understanding the more complex problems.

- The type of assessment we currently have – "continuous assessment" with no end-of-year 12 external exam - means that students learn a unit and then forget it and move on to the next. We are turning Maths into a quasi Social Science subject.

5. Numerical marking is valid and reliable but the QSA's critera are not
   * To assess school mathematics, the most appropriate way is to conduct a test, add up the marks and report a percentage. This is easily understood by both Parents and Students. It is repeatable and equitable if all students are sitting the same test for at least part of their overall result.
   - On the other hand, QSA's policy of grading mathematics through the tables of paragraphs in grids (on p34-36 of the attached Maths B syllabus) is absurd, subjective and problematic. Each different teacher can and does arrive at a different result.
   * As an experienced teacher, I know, that regardless of advice by the QSA, there is no consistent way of assessing students appropriately or in the same way as my colleagues. We spend many hours trying to ensure equity. Marking schemes are constantly adjusted to cope with the different student responses. Is it a C or a B standard question or is it a D or maybe I could give it a B? There is absolutely no consensus.
   - The QSA claimed in parliament that its detailed criteria-standards grids are meant to mark standards. What a silly reason to invent a new method, that is extra to the test itself, that is so misleading. The real standards that everyone expects are already contained within the test questions of a well-designed exam.
   - As said in the parliamentary forum on May 1st, 2013, by a university expert from the veterinary sciences, it is essential to not only test the foundational knowledge but to prove it is repeatable. In fact, a well-written exam makes sure that real standards are tested repeatedly and assessed reliably with multiple sets of questions. The more a student gets correct, the higher the total score. They not only find out if they passed the standards required, they get an accurate feel of how much they passed (or fell short of) the minimum threshold. This gives direct feedback on the achievement in the subject, like a savings account balance sheet that adds up all the credit.

6. Assignments are an invalid way to assess mathematics
   - At the high school level, written assignments do not develop fundamental mathematics skills. They detract from **regular homework and study for tests.** The latter are essential to develop a depth of understanding of content, without which problem solving is impossible.
   - Students rush from one assignment to the next just trying to keep ahead of the assessment. There is no time for thinking about the work

taught that day. They are just trying to survive and many are stressed and dropping out of Maths, Physics and Chemistry.

We need students with a high level of Maths and Science knowledge if we are to be a clever state and country. The assessment procedures we have in Queensland are holding our students back.

In conclusion, I believe that we need urgent change to the current system.

- I believe that the QSA is not listening to teachers or other very well qualified people and is not prepared to change the system even when presented with reliable data.
- The Queensland government will need to force this change if we are to give Qld students the same opportunities that are currently enjoyed by students in other states. This change must happen quickly. As a first suggestion, bring about a return to marks and percentages and do this immediately to bring clarity to current students and accountability to reassure concerned parents. The current approach has had more than enough time to produce outstanding results. It has not and Qld and our students are suffering under an experimental approach that is unethical.
- The QSA's people in charge have not seen the inside of a classroom for many years and will have to be forced to accept that their pet approach has failed and that change is urgent. I hope that the recommendations of this inquiry are strongly worded and that the implementation of these is done quickly.

Please adopt the following recommendations –

a. From January 2014 (latest), re-introduce numerical marking. Also, urgently engage Maths and Science specialists to approve the foundational content and remove instructions that do not relate directly to content (i.e., excise non-mathematical and non-scientific criteria or 'standards' as they are now called) from the relevant syllabuses.
b. From January 2014, for all senior students (including those entering Year 12 in 2014) provide that *no* further mathematics assignment is to count towards a student's Year 11 and 12 final grade. Assignments done by Year current 11 students in this year, 2013, should count for no more than 30% of the final grade.
c. From January 2014, assignments in physics and chemistry are to count for no more than 10% of the final grade in those subjects and to be capped at a maximum of 600 words.
d. External exams for all senior maths, chemistry and physics subjects to be sat from Term 4, 2015 counting for 50% of senior assessment.

The QSA Board should be immediately given notice to show cause why their positions should not all be terminated and legislation should provide for a re-constituted QSA Board to ensure a high level of representation by mathematics, chemistry and physics university academics and senior teachers in those subjects. Education academics should not have any input.

[redacted]

A signed copy of this submission is in the post.