SMC&PA Submission 64
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Submission to

The Parliamentary Inquiry into Senior Mathematics, Physics and Chemistry Assessment

My Background:

My qualifications are a degree in chemistry and a diploma of education.
I am a high school chemistry teacher with approximately 30 years experience.
I have taught in remote areas of Qld as well as in city schools.
I have been a member of district panels for approximately 25 years.

Terms of Reference 1.

Ensuring assessment processes are supported by teachers

1. The workload of teachers.

I note that HODs have made many of the submissions to date, and indeed, even a public representation to the committee. While I am not questioning their hard work and dedication, the fact remains that HODs are on reduced teaching loads. Not all schools have science HODs that write work programmes: syllabus interpretation and programme writing in many schools is delegated to teachers. Since the workload of teachers has become an issue with the new syllabus, the perspective of teachers is also important. I would be willing to speak to the committee to address this imbalance if necessary.

It is difficult to identify a representative "teacher'. Many have been solely responsible for the implementation of the new syllabus. I know this because apart from being one of those teachers, I was also responsible for passing on the concerns of other teachers involved in the same position to the QTU. The QTU mentions these concerns in their submission. Many teachers are angry that their workload has become unmanageable. There is a system in place that purports to manage such things as workloads via enterprise bargaining agreements.

I, along with other teachers that I know of, am in the process of preparing an exit strategy from the system. I can no longer tolerate a system that demands that I give all of my energy to an impossible assessment regime. Instead, I should be giving my energy to the students I teach. Teaching in the classroom was why I became a teacher in the first place: I do not see my time as a commodity to be utilised by the QSA's assessment system.
To give the committee an idea as to where teachers' time goes in assessment, I'll give one example:
Criteria based marking in exams (even for short answers).

Knowledge & Conceptual Understanding			Investigative Processes			Evaluating & Concluding		
C standard questions	B standard questions	A standard questions	C standard questions	B standard questions	A standard questions	C standard questions	B standard questions	A standard questions
Maximum Mark C+	Maximum Mark B+	Maximum Mark A+	Maximum Mark C+	Maximum Mark B+	Maximum Mark A+	Maximum Mark C+	Maximum Mark B+	Maximum Mark A+

E.g. the top student with everything correct would end up with a score consisting of 9 "symbols" i.e. C+B+A+C+B+A+C+B+A+

All possible results:

C standard questions= 9 possibilities, C+ C C-D+ D D- E+ E E-

B standard questions= 6 possibilities, B+ B B- C D E

A standard questions = 7 possibilities, A+A A- B C D E

Therefore, for 1 exam, there are 9x6x7 possibilities for each criterion and (9x6x7) x 3 for all 3 criteria = 1134 possibilities for a student's result.

There used to be 100 possibilities when we used a percentage.

2. Interpretive differences over EEIs

Teachers cannot support assessment processes that are ambiguous and subject to misinterpretation. The following example illustrates my point about different interpretations of the syllabus.

The following paragraph is from the chemistry syllabus that relates to EEIs. (Emphasis is mine).

> Within this category, instruments are developed to investigate a hypothesis or answer practical research questions. ***The focus is on planning the extended experimental investigation and problem solving using primary data generated through experimentation by the student.*** Experiments may be laboratory- or field-based. An extended experimental investigation may last from four weeks to the entirety of the unit of work.

'Primary data', I believe, is taken to mean data generated by the student during experiments conducted by them. I refer to the following link:

http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/trns-pb20Mar2013.pdf

In this link, that was part of the QSA demonstration of EEIs, the data used is secondary data downloaded from the Internet. The point was also made that hours of laboratory work has been saved because students could obtain ready made data rather than generate their own. I do not support any assessment process that bypasses the development of students' manipulative skills from doing experiments.

Science is an experimental science and in high school chemistry students should have the opportunity to develop a wide range of manipulative skills. EEI's reduces the variety of experiments that can be done since time is taken up with one experiment rather than many different experiments.

3. Panel meetings used as professional development.

A number of the submissions have stated that the writer supports panel moderation as the panel meetings are a useful source of professional development in the area of assessment. While some HODs and teachers have access to panel meetings, many teachers in remote areas cannot attend panel meetings since they are not within driving distance. I cannot support assessment processes that disadvantage geographically isolated teachers.

The QTU has also raised the issue of equity when performing EEIs across the state:

..”However, the QTU recognises that there are serious equity issues which exist in terms of the resourcing of schools and the access of students to expert mentors and the impact this has on the conduct of EEIs”….

4. Use of written assignments discriminates against boys

The following information is extracted from an article by John Ridd titled: *Educational sexism in Queensland***.** The link for “Educational sexism in Queensland” is:

http://www.onlineopinion.com.au/view.asp?article=14942&page=4

The article has evidence that states:

> “…2012 OP results: severe anti male discrimination of a magnitude that is about two full OP bands
> …by 2012 things had changed, assignments as opposed to formal examinations had spread to all subjects and sexism was clear and major in size.”

No assessment process in maths / science can be supported that discriminates against boys.

5. Lack of a nuanced approach to assessment.

The assessment now allowed by the QSA is qualitative, criterion-based- regardless of the task. Science is a knowledge-based discipline and in order to test a student’s understanding it is often appropriate to compose short answer questions. I have composed chemistry exams where the descriptive paragraphs used to mark the short answer responses are longer than the questions! Apart from being extremely time consuming, such an approach is frustrating since I can find no evidence that supports one type of assessment only.

Terms of reference 2. Student participation levels

Students not completing the course.

From the data tabled by the QSA, 9278 students enrolled in chemistry in Year 12, in 2012 with 7389 completing the course. That means that 20% of students dropped chemistry during the course of study – that is a large percentage. In my experience, I find that for students studying physics, chemistry and biology the workload is too much – 3 EEI’s to complete & this may contribute to the large drop out rate.

I am not confident that the syllabus is age appropriate. When I studied for my degree in chemistry, I did do a research project, but not until my final year. I find that high school students can be overwhelmed with both the literary and research skills required for chemistry. I note that the syllabus committee does not have university representatives from the chemistry faculty.

Terms of reference 3.

The ability of assessment processes to support valid and reliable judgments of student outcomes.

In terms of whether it is reliable, in a survey from the QIEU—a survey of teachers, there were about 700 respondents—fewer than 50 per cent of maths and science teachers said they had confidence in the results that it gave.

Since students write assignments outside of school, it is impossible to know if it is their work. Given that EEIs are worth so much – they are often a third of the assessment that goes to the panel in September – valid judgments are not possible.

It is difficult to obtain reliable judgments from school to school since schools have such different interpretations of the syllabus: comparability between schools is extremely difficult if not impossible.

Conclusion:

I do not support the QSA's system of assessment.
The QSA has alienated many teachers with their extreme views on assessment: many teachers I know are voting with their feet and leaving the system.
I believe that urgent action is needed to create a system of assessment that is supported by, and is fair to, both teachers and students.