SMC&PA Submission 5
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Education and Innovation Committee,

Please accept this submission.

I have taught Senior Chemistry, Physics & Mathematics A,B&C in Queensland state schools since 1992 and have been a Physics panellist/panel chair since 1998. I have seen three major changes in syllabus.

In the past 2 or 3 years, due to panellists leaving panel due to a variety of reasons (disillusionment being one of them), district QSA organisers have had great difficulty filling these vacancies and when they do, the new recruits are thrown straight into the melee with no training. The past few moderation meetings, in this district at least, have had no pre-reviews due to floods, although submissions had been sent to QSA offices a month prior to the floods and Australia post trucks had been spotted driving around over a week before the last flood waters receded. We were instructed to give at least three school submissions a going over (note: "at least"). There was no time for meaningful discussion with other reviewers. I fail to see how this is a "world leading practice". If this method was shown to other countries' educational bodies it would be laughed out of the room.

I also take issue with the argument regarding “similar problems” with the old system. As a panel chair I had first-hand experience in dealing with schools who did not understand the meaning of syllabus standards and requirements. In my opinion, the descriptors used for different criteria and achievement, were far simpler to decipher and explain (plus there was the unwritten law of % cut offs and % trading which could stop any arguments about rung shifting, even though the 95 syllabus made no mention of using numbers to grade marks. I was teaching for a few years before I realised this, but was happy to go along with this rule of thumb, AS WAS THE QSA, who’s SAOs gave advice as if % cut offs were in fact policy). The actual written achievement criteria could and should have always been referred to when reviewing threshold students. As a panel chair I directed my panels to always use this as a final arbiter along with the usual and more important rejoinder that you are to look at the package as a whole to SUPPORT the school’s judgement and to refrain from pedantry. The language was nowhere near as ambiguous as the current syllabus and it did not take long to explain to a school where their problems lay and how to fix them.

Descriptors in the new syllabus can be twisted to mean many things. The debate about what constitutes “data” analysis is a case in point. Some regard researched information as data, whereas some would violently disagree on this. When two people with differing opinions on this are sitting on a panel, it can make for an interesting moderation day, until the chair steps in and places their own interpretation on the final comments.

If the QSA is so pleased with its “world leading syllabi” they need to take a look at what our govt funded Schools of Excellence (particularly the one at Toowong) use in their curriculum. As these institutions have direct contact with local universities, and are very interested in how their graduates perform at said institutions, they are very aware of the content and skills required in engineering and science based courses.

One thing that really bugged me with the 07 syllabus was the complete disregard for small task specific experimentation. The trial syllabus included SEIs, which were subsequently dropped. The

original QSA directives regarding ERTs specifically said that experiments were not appropriate. I have incorporated experiments into an SA task. The experiments are linked to one topic, are assessed and then used as stimulus material for a WT under exam conditions.

I am on the fence about EEIs. They can provide very useful learning experiences but the work load required by a student doing two or three sciences along with English, Maths B/C, H.P.E. or a humanities subject is horrendous. Staggering science EEIs across terms does not take into consideration the assignment load of other senior subjects or the fact that a student does not have a sufficient knowledge base to conduct such an investigation, if the EEI is early in the year. Every year, without fail, I have had brilliant, high achieving students break down in front of me, particularly around term 3, because of the assignment commitments they have, not to mention the fact that most of them have part time jobs.

If you are a teacher of more than one senior science, and this happens often in small schools, the workload can become a nightmare. Or the opposite, when you are at a large school with large class sizes, the same thing happens.

I don't see why the SEI idea can't be reintroduced instead of an EEI in year 11. If you do a science/maths/engineering degree, the large project/thesis was not part of your course until the end of course, when you had a solid knowledge/confidence base.

I and every teacher of science and maths I know (this is not a general statement, I am the direct line manager of most of the science/maths teachers at this school) are amused by a recent QSA directive that stated we were never directed not to use numbers for assessment marking. This is a prime example of the QSA putting out contradictory statements. Or it could be a sign of having enemies in high places rather than friends.

On the subject of the popularity of EEIs, this is subjective. I know my students enjoy the challenge and the actual execution of the EEI, but the subsequent work required to fulfil the criteria and understanding of the criteria is the problem. From a teaching perspective, time spent doing EEIs is time not spent teaching essential content coupled with small specific experiments that model content being taught. I understand the intent of the syllabus was to have more focus on innovation and design, regardless of this intent, in the end students will simply be verifying and testing an already known law or theory. Surely this can be done on a small scale – and we all know it can because it's what we used to do.

As someone who advises students and parents on year 10 SET plans, I have advised students interested in engineering to see Maths C as a better option than Physics. This may make some people palpitate, but this is not something I take lightly. I live in a smallish community and have frequent contact with parents not only in the school setting but in a social setting. I get regular updates on their children's university progress and am yet to have someone admonish me for giving them a bum steer. Every year past students visit me at school and I quiz them on what's happening in their uni courses. At least half of my senior Physics students go into engineering. They say it is the Maths that blows them out of the water particularly those who did not do Maths C. It is often Maths skills that let students down in exams. Some students have parents who are engineers and I have had several discussions with regards subject selection. These parents were mostly aware of the

Physics syllabus as their older children had passed through as well. They were also aware of the Maths C syllabus having done Maths II when they were at school and agreed with me that the Maths C course was far better at preparing students for engineering as it included Physics principles such as dynamics and forces and dealt with them in a far more intensive and mathematical way than the Physics course did.

When I did Physics at school it was a prerequisite that Maths II was also done as the Physics course, particularly linear/angular motion and Forces were taught with a heavy Mathematical emphasis. In between leaving school and entering the classroom (in the early 90s), this mathematical basis had disappeared and prerequisites could not be enforced, subsequently I have had students doing Maths A in my class, who of course struggle, but with perseverance, still pass, whereas in the past they would not have stood a snowball's chance due to the rigour of the Physics course.

The complaint that the course is not rigorous enough will be negated by the introduction of the NC, however the current model of assessment (i.e. using EEIs) will make it difficult to cover the required content. An EEI limits students in that it generally involves investigating one particular aspect of a topic(e.g. a trebuchet analysis does not cover the entire content objectives of energy, motion, forces and if they are covered, considering the supposed word limit, they would not be covered in depth). I suggest going back to a model of a folio of short experiments relating to one topic with rigorous analysis questions (or used as a stimulus response). The idea of an EEI could still be used but the ambiguous criteria descriptors need to be changed back to a simple content/process model with clearly defined standards. I know that similar assessment pieces to EEIs are used in the southern states, but I think only one is required across two years and as I stated before it would make sense to do this at the end of the course, when the content and skills have been embedded.

Thank You

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