SMC&PA Submission 157
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Submission to the Parliamentary Inquiry into assessment methods used in senior mathematics.

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Background: Current HOD (Maths) at a large private school; previous positions held include HOD (Maths) in the state (EQ) system; Chief Examiner of Queensland's External Mathematics B, External Mathematics A and External Mathematics C (now defunct); District Panel Chair for Mathematics C; Immerser and Marker of QCS Test (SRI); Review Officer (Mathematics A, B and C) with QBSSSS (now QSA); Raybould Fellow (University of Queensland and Education Queensland).

I am supportive of the current school based externally moderated model for assessment of senior mathematics. Queensland moved away from external exams for sound reasons and those reasons still exist today. It would be disappointing to see that model re-introduced completely. I believe that being a skilled mathematician (or physicist or chemist) does not equate to being a skilled assessment writer. Often a higher skill / ability level can mitigate against being able to provide assessment tasks which allow all students opportunities to demonstrate knowledge and skills. Generally the 'best' assessment tasks are set by teachers teaching the subject.

Many of the difficulties about the current system and their consequences have been elucidated in other submissions. Many of these could be addressed by appropriate professional development. However as budgets are always shrinking there is very little incentive (especially monetary) for a provider or institution to make professional development a priority. Schools are time-poor as well and often make sacrifices in their needs to accommodate what they can. Paying for professional development for syllabus / curriculum implementation is considered to be a responsibility of the syllabus developer.

This has meant that the confusion and dissatisfaction with the assessment practices has gained momentum in recent years. In my view, it has been exacerbated further by two issues which could easily have been fixed.

(1) The first of these was illustrated most clearly in the Public Briefing with the setting of assessment items as B (or C) standard and then the highest grade awarded for a perfect answer is then a B (or C). This was portrayed as exemplar practice when it fact it is just one way of setting assessment items which make up an assessment task. This method is time consuming (as is any other method) and then the marking / grading of the items and task is even more so. This is a lose-lose situation and a lot of the confusion and anger has come about because of it as schools are being encouraged (some would say coerced) to adopt this method as it is the only method which ever receives professional development. The biggest problem with this method is that it is back-to-front. The aim of the assessment is to judge the student response as a B (or C) rather than the task. A well-constructed assessment task will contain the objectives embedded in the task in a balanced manner for judgements then to be made on how the student responds. Further this method adds another layer of Bs and Cs in the grading of assessment; for example in a school adopting this method there would be: questions / items graded as B (or C); the student response to the item graded as B (or C); the assessment task graded as B (or C); the summary grade for the semester graded as B (or C) and then a level of achievement graded as B (or C). Eliminating the first two of these in this chain would remove some confusion [(say) student tells parent "I got an A" would be reasonably clear what the A was for]. The method described in the Public Briefing is valid and reliable as are other methods which are less confusing and less time consuming, especially with the marking, which many other submissions to this inquiry point out.

(2) The second of these issues concerns the reliability and validity of assessment within a year level, across a school faculty and across schools in the district and/or state. QSA data / research show state-wide judgements made by schools to be within 'margins of error' and to be more valid and reliable than an equivalent external examination. I believe this is true but there is a lot of stress amongst teachers along the way. Some of the issues needing be addressed include (a) on-balance judgements (b) use of marks and (c) use of criteria sheets.

(a) In a practical sense (and this applies especially at Panel) on-balance judgements are made from a profile of the student's results rather than reference to the syllabus descriptors. Many of these on-balance judgements are plainly wrong. Consider the student with summary grades towards Verification of C A D A C. The As were achieved in assignments [typically 1-3 weeks work]; the Cs were achieved in mid-semester examinations [typically 5-7 weeks work] and the D was achieved on an end-semester exam [typically 6-8 weeks work]. The school is likely to propose this student as a B (probably HA1 or HA2). I would propose and argue strongly for this student being a mid C (SA 5 approx.) as under exam conditions especially the end-semester exam likely done under block conditions of QCS-test type supervision the student response is poor. This conflicts with the good responses to assignments where a lesser amount of work is covered and there is no guarantee that the work produced is entirely the students own work. Using a numerical system would allow each assessment task to be weighted according to its contribution of the amount of the curriculum covered. The QSA stance on the use of marks/ weighting has meant the contribution of assessment tasks making up a summative grade has led to an imbalance such as this.

(b) "Teacher judgments made using numbers, letters or other symbols must explicitly identify the standards demonstrated and how the qualities in the student responses match the standards described in the syllabus." The vast majority of teachers and parents want the use of numerical scores / grades / marks. How to do use marks should have been made clear when QSA issued this statement, as a process already occurs when the OPs are calculated.

(c) The use of criteria sheets in mathematics has been in operation for 30 years, however they are generally done poorly and hence resistance to use them grows. The recent revision of the mathematics syllabuses from a minimum standards model to a typical / characteristics model should have (but didn't) make the grading of items, tasks and folios easier to implement. What has evolved to the current situation is that most of the criteria sheets are merely check lists and tick sheets; rather than a search of objectives. This has resulted in teachers placing key words in the task and looking for the specific 'key word' in the student response. These key words include *assumptions, strengths and limitations, validity*. Without these specifically being included in the student response many items are awarded a lower grade irrespective of the insight / quality of the response. One of the global aims of the mathematics syllabuses is to develop an understanding of the diverse applications of mathematics. To judge an item / instrument not to be showing this understanding because a key word is missing is an issue needing to be addressed.

A summary of the above points:

- A switch to external examinations is not the panacea for the issues and difficulties in mathematics
- Professional development is not as readily available as it should be and what is available is expensive for schools
- Methods of setting and marking assessment items and tasks need to be provided to schools other than the B (or C) standard method explained at the Public Briefing
- A Level of Achievement needs to reflect student performance in a balanced way e.g. by weighting tasks according to their contribution of the overall assessment.
- Professional development is needed to show how marks may be used in assessment.
- Show how judgements can be made based on the quality of a response without having to word search for a 'key word'

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