Submission to:

The Parliamentary Inquiry into Senior Mathematics, Physics and Chemistry Assessment

By Sarah Frost

(M.Ed, Ba Hons, PGCE)

9th May 2013

Dear Committee Members,

I am an Educational Consultant in Mathematics. I have completed a Masters Degree and have specialized in teaching Mathematics to children with learning difficulties. My teaching career spans 20 years and I have taught in England, Papua New Guinea and across Australia. It is with this experience that I would like my observations to be considered regarding the QSA assessment system.

I would like to address the following concerns:

1. Is the assessment system fair?
2. Is the marking standardized across Australia?
3. Is the marking of assessments unbiased?
4. Does the Senior Mathematics Program result in the acquisition of information necessary for university and the workforce?
5. Are students sufficiently prepared for Senior Mathematics?

1. Is the assessment system fair?

   The nature of the curriculum means that a large proportion of the students' work is learnt and completed at home in an environment not supervised by an impartial adult. A significant proportion of the assessment is also completed at home.

   The problem with this is originality. I am aware that a large number of children require tutors. The gap that these tutors are required to bridge is so significant that many of the tutors find themselves providing too much assistance and the student's work that it is no longer their own.

In this case the attained mark is not an indication of the student's ability. For this reason, **I believe that a greater proportion of the mark should be exam based.**

2. Is the marking standardized across Queensland?

In this mobile world where people move between states and countries with growing frequency, the marking system needs to be carefully standardized across schools. The current school based system results in an unhealthy and inequitable learning and assessment environment. The objective of the marking system is to create a standard measure by which students are compared. Students across schools and states are ultimately competing against each other but they are currently doing so in incomparable systems of assessment and reporting. **Only if exams are standardized will the student's results be truly indicative of their ability relative to other Queensland students.**

3. Is the marking of assessments unbiased?

The internal (QSA approach) marking of exam papers opens the system to bias and partiality, therefore making it **invalid** by measuring the wrong type of knowledge due to biased questions and making it **unreliable** due to subjective marking. A teacher who knows the student will have a pre-conceived idea of how the student is likely to perform. In situations of ambiguity of response, the teacher may be tempted to let their opinion affect the way they allocate marks. **The only way to avoid subjectivity is to set clear marking criteria for state (or national) exams and have an unbiased team mark them externally.**

4. Does the Senior Mathematics Program result in the acquisition of information necessary for university and the workforce?

Students are more likely to retain information if the acquisition of knowledge is cumulative and if it is revisited more than once. It has been shown that students who follow the International Baccalaureate are more prepared for university because they retain what has been taught. The work is not learnt for a one off exam and then forgotten. Concepts are learnt and built upon. Re-testing in the exam at the end of the course encourages students to learn information for the long-term.

Students would retain information better if they took tests at the end of the year rather than at the end of each concept.

5. Are students sufficiently prepared for Senior Mathematics?

Teachers are 'cramming' in the topics they feel need to be covered despite very inadequate syllabus guides provided by the QSA for Years 11 and 12 and ticking the boxes for the benefit of following their guidelines. This is at the expense of ensuring sufficient generalization and application of knowledge. Students do not have time to revisit concepts that have not been understood and the resulting gaps result in loss of confidence, self-esteem and building blocks of prior knowledge necessary for effective learning.

Teachers should receive in service training on the most effective way to teach Mathematics. Programs such as C2C that are based on assumptions, cannot work for every student in every class. Teachers should avoid jumping between concepts (as is currently the case) but should make logical connections between concepts.

Students would be better prepared for Senior Mathematics if a more structured approach were taken from primary school onwards. Greater emphasis should be placed on the importance of laying firm foundations.

In summary, my recommendations would be the following:

- **Marks that report percentages** instead of criteria based marking system.

- **Weighting of internal assessment tasks reduced substantially** i.e., the students must be given the numerical weight of each component at the beginning of each term or semester. These components are tallied towards a final subject graded (called composition or combinations). This is the least that must be done in Queensland immediately. Then when a common statewide exam is used at the end of each year, the internal component (what is done differently in each school) may be given a weight, but not excessively compared to the external exam.

- **A team of external professionals marking exams and assignments.** They should not be teachers already employed in the district, to avoid bias.

- **Exams set at the end of year 11 and year 12.**

- **Exam papers that are standardized and set across the state (or preferably nationally).**

- **Specialist teaching should occur from primary school onwards.**

These suggestions are logical and will not only raise the real standards of education so that students are better prepared for university, but will also reduce the cost of administration due to streamlining.

Thank you for taking the time to consider these proposals,

Yours Sincerely,

Sarah Frost.

(M.Ed Learning Support)