SMC&PA Submission 227
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Inquiry into the assessment methods for senior maths, chemistry and physics.

My Background

I have been teaching physics for 19 years. During this time, I have been on a physics panel for approximately 15 years and a Science Head of Department for 6 years.

Ensuring assessment processes are supported by teachers

And

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

I do not support the assessment methods used in Queensland schools. The processes are ineffective at providing valid and reliable judgements, under resourced and are open to cheating. They lead to inefficient student learning, impossible workloads for teachers and a narrowing of curriculum knowledge. I am no longer confident that my school is adequately preparing students for university should they choose to follow a course that requires a foundation in physics or chemistry.

Interpretations of some criteria and standards vary between colleagues, including at panel meetings. Considering the limited time available to analyse a submission for a panel and the requirement to provide evidence for adjusting the placement of folios using the QSA's imprecise standards, I suggest that a panellist is often forced to agree with the submission unless there are obvious errors. I therefore do not believe that valid and reliable judgements on student performance are being made.

The assessment methods are inadequately supported with resources and require inappropriate amounts of teacher time to source or create. Assessment items that provide a good match to some of the criteria are rare. There are insufficient quality assessment pieces for teachers to use both in summative assessment and for student practice. In an early panel training workshop, I requested an example of an assessment piece that demonstrated EC1 (analysis and evaluation of complex scientific interrelationships) from the trainer as, after many frustrated hours trying to interpret this criterion and then find or create an assessment piece, I had nothing. I was also concerned as a panellist that if I did not fully understand this criterion I was not in a position to comment on another school's submission. The response I received was essentially that they were unable to provide an example but would give me comments or feedback once I had written one. In this regard, I would welcome an external exam where the question types are known and students and teachers can easily access past papers for practice.

Extended Experimental Investigations (EEI) and Extended Response Tasks (ERT) have some positive aspects to them but generally they are an inefficient assessment method for many students and do not allow for valid and reliable judgements. The time required to complete an EEI leads to a lack of: topics covered in physics, experiments performed that promote learning efficiently and effectively, and practice in problem solving. Students spend large amounts of time working on EEIs and ERTs with a generally disproportionate amount of learning as a result. Both EEIs and ERTs should not be used for 'high stakes' assessment because it is almost impossible for a teacher to verify authorship.

The QSA's 'on balance' approach for determining overall standards does not support reliable judgements. It relies on a teacher's interpretation of a list of grades and the assessment items themselves with no clear

algorithm for determining placement. Not only is this method unreliable, it can sometimes be impossible for teachers to differentiate the placement of students, especially in large cohorts.

I am deeply concerned about the cost to Queensland education in terms of the loss, or potential loss, of experienced science and mathematics teachers and the reduction in effective teaching and learning as a result of the introduction of the current assessment methods. I have had numerous conversations with colleagues who are considering exiting our system out of frustration with the current assessment practices. While not quantifiable, in my opinion, I have seen a reduction in student learning in the classroom due to upward pressure on teacher workload around assessment. While not intentioned, the reality is that the current assessment methods have caused teachers to spend inappropriate amounts of time writing and marking assessment and this, in my opinion has led to a decrease in time and energy spent on lesson design and delivery. I fear that the cost to Queensland science and mathematics education has already been immense and there is potential for further loss if this system continues.