

To: The Education and Innovation Committee
Subject: Assessment methods used in Senior Mathematics, Physics and Chemistry

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I have taught secondary mathematics at all levels for 33 years in Qld, NSW, WA and New Zealand including the last 23 years in 3 different private secondary schools in Brisbane. I have been a maths B panel member and an assistant Head of Maths.

The Current Qld Grading System of maths assessment takes an unwarranted amount of student and teacher time away from learning opportunities and produces less reliable judgements about a student's level of achievement than the Traditional Marks Based grading system. This short comparison between the two systems of assessment attempts to explain some of the reasons for my claim.

Feedback re the validity of the Current Qld Grading System of maths assessment to provide reliable judgments of student outcomes

1. The Current Qld Grading System inflates results for some students

Applying the Current Qld Grading System to exam assessment requires questions set at each of the levels A, B, C and D. Many schools set 2 questions at each level in one exam and hence students receive 2 grades at each level, the best possible result being DDCCBBAA. An overall grade for one exam is determined from the highest level at which the student performs. For example, a student who demonstrates mathematics at C level is awarded an overall C for that exam. So an interpretation of the Current Qld Grading System in a number of schools is that the minimum standard for an overall C- grade be awarded for results of CDEEEEE in an 8 question exam. This corresponds to <25% competency of the skills being assessed.

Interpretations do vary, but the current Qld Grading System makes it possible to 'pass' maths with competency in much less than half of the skills/concepts presented in the course. This has in effect dumbed down the value of maths results both as a contributor to the OP score and also as a public benchmark of maths ability. A Qld year 12 student who received an exit grade of a low C would very likely receive an exit grade of D if assessed using an interstate or international assessment and grading system on exactly the same coursework.

2. Higher level of inconsistency between schools using the Current Qld Grading System to determine exit level

Student's exit results are affected by changing the number of assessment items. A folio of student work graded by 3 different schemes can result in different Knowledge and Procedures exit grades for the student.

For example:

Comparison of grades for variation in the number of assessment units in year 12							
<u>Number of units</u>	<u>Term 1</u>	<u>Term 2</u>	<u>Assignment</u>	<u>Term 3</u>	<u>Term 4</u>	<u>Assignment</u>	<u>Exit level</u>
10 KaPs results	A B	B A	A	A A	C A	A	A (7A/10) Consistently A
6 KaPs results	B	B	A	A	B	A	B (3A3B/6) Consistently B or better
4 KaPs results	B	B	- (no KaPs Q)	A	B	- (no KaPs Q)	B (1A3B/4) Consistently B or better

3. Traditional Marks Based grading is fair, easy and has better ‘quality control’ than the Current Qld Grading System.

Traditional Marks Based grading:

- better allows for transparency of marking and students can see clearly how they have lost marks and how they can improve their result
- is not subjective and enables better consistency across and within classes
- better allows for fast accurate marking and grading with no ‘trading’ and
- also allows fairer and more transparent fine tuning of rank order within a band

4. There is a closer alignment between traditional marks based grading for assessment and the demonstration of skills that match the syllabus objectives for Knowledge and Procedures.

Traditional marks award ‘merit’ for each formula, rule and skill etc. demonstrated. Hence Traditional Marks Based grading is appropriate where a series of skills is being assessed which is the case in Knowledge and Procedures. Even the discriminating questions which include testing of the objective ‘recognise that some tasks may be broken up into smaller components’ can be awarded marks for the separate components.

KaPs questions are testing procedural skills and in the current Qld Grading System of exam setting the question divisions are somewhat arbitrary. Hence the ‘full solution’ method of marking isn’t appropriate as students can be unfairly advantaged or disadvantaged by the arbitrary way the topics are grouped into each question to get the right ratio of A, B, C and D level questions.

Using Traditional Marks Based grading in KaPs the overall grade for an assessment item explicitly reflects the overall demonstration of KaPs techniques being assessed. Marking traditionally is a sharper, finer tuned measuring instrument enabling a more valid judgement of student outcome levels. The Current Qld Grading System is a ‘blunt’ measuring system and is not suitable for Knowledge and Procedures.

5. Current Qld Grading System unfairly boosts exit grades for students with high assignment results

Students gaining high grades in assignments can have their exit grades unfairly increased. For example, imagine a struggling student whose parents obtain paid help (a very common occurrence) for assignments and hence the student attains excellent assignment results. In this example the red grades are from assignments.

Knowledge and Procedures: C, A, B-, B, D+ overall exit level B- (consistently B or better)

Modelling and Problem solving: D+, A, C-, A-, D overall exit level C+ (consistently C or better)

Communication and Justification: C+, A, B-, A-, C- overall exit level B (consistently B or better)

These student results give a B- using the Qld Grading system but clearly would be low C without the assignment results. Hence Qld year 12 maths exit results can be a poor indicator of ability in maths.

At a professional development session I attended with a group of 30+ maths B teachers, the majority (it appeared unanimous to me) of teachers objected strongly when we were informed that, from now on, assignment results were to be given equal status as formal exam results. Discussion was not permitted and we were informed ‘you are doing as you are told from higher authority.’

6. By not running external exams the Qld internal assessment system is open to a variety of possible rorts hence the validity of student results is compromised.

- Teachers can teach to the exam and not the syllabus
- Teachers can provide revision sheets to unobtrusively direct students to exam questions
- A teacher or department is at liberty to run practice exams
- It is possible for teachers to privately coach students
- Ex-students are valuable coaches as they know what the school tests
- A top streamed class might focus on contexts that give familiarity to higher order questions

- A department may choose to deliver a lower level of maths content to give their students a ‘better chance’ at high marks.
- A department is at liberty to run small assessment units and staple them together as if it were a term test.

Feedback re the effect of the current Qld Grading System of maths assessment on motivation and learning opportunities

The Qld Grading System of maths assessment demoralises students and teachers from both the time taken for assessment and the time spent marking it (i.e. students preparing for and doing it, teachers preparing students for it, setting it and marking it, recording the many, many criteria grades and then processing results).

1) The Current Qld Grading System demoralises some students

For assessment items (e.g. exam questions) set at an A or B level, student responses will not contribute to their grade until they have demonstrated maths at the required level for a particular question. Hence there can be students who demonstrate some good B or C level mathematics in these higher order questions but it will not usually contribute to their grade. This is very disconcerting to students and parents when they realise that correct maths working has been ignored when accumulating the overall result and that this student’s efforts are treated the same as students who could not even attempt a higher order question.

2) The quantity of summative assessment denies the opportunity for students to develop holistic maths learning

- The current Qld internal continuous assessment system has all the characteristics of a ‘test and forget’ learning model.
- Maths learning units have become so ‘packaged’ for assessment that year 12 Maths B students who pass and even those who gain high grades are commonly not able to recall many basic maths skills. In recent years, the overall maths skill level of many maths B students can often be described as ‘appalling’ but this is not exposed by their exit results.
- By assessing so frequently Qld has denied students the opportunity to integrate maths concepts into a ‘whole’ which can be achieved when an external exam of 2 years’ work is required.

3) The Current Qld Grading System absorbs an enormous proportion of available teacher time

- The need for strong collaboration when marking assessment takes an enormous amount of teacher time to get it right.
- An enormous and unwarranted amount of time is taken up with the tedious recording of results for the numerous criteria within each level of assessment items.
- The teacher time taken up with assessment significantly reduces class preparation time for quality teaching.
- ‘All I do is set assessment and mark it; this constant Qld teacher ‘cry’ is so true.
- ‘All I do is cram and rush from one assessment to the next’; this constant Qld student ‘cry’ is so true.
- The current Qld Grading System has had a significant impact on teacher morale and teacher health.
- The work-load of assessment setting and marking:
 - significantly diverts teachers from professional preparation and delivery of quality learning experiences
 - is not at all commensurate with the quality of the outcomes for both classroom teaching and the maths proficiency levels of students
 - is counterproductive to achieving the goals of a world class education