SMC&PA Submission 214
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Dear Members of the Innovation and Education Committee,

I request that my personal details be withheld from publication.

Student Participation:

1) A major reason students drop out of Maths B and C is the rigour required and lack of basic knowledge and ability (Science is because of the assessment, but not so much in maths). This is partly due to less practice and repetition of problems in Year 1 to 9 so that assignments, investigations, QCATS (which has been discontinued), etc can be completed. These activities (which require a greater emphasis on English ability) lead to less "maths questions" being completed and as most maths people will say "practice, practice, practice". Some students are just not up to the task of Senior Mathematics. Perhaps some of the reason why, is that the Senior Maths Syllabus does not require students to "correctly" solve maths problems but still achieve an A or B standard anyway through other attributes in the standards. Similarly, they may get an answer to an extremely difficult problem completely correct yet only a C standard is displayed due to not meeting all the "other" attributes in the standards.

2) Another major reason is The Queensland Certificate of Education (QCE). The student decline here is driven by the students and the schools (because of the importance of "data"). This has also affected the QCS Test and OP results.

   a) Students are concerned that they may fail Maths B and so change subjects to Maths A to ensure they pass and get their 4 credits to go towards their QCE. The reality is that a LA9 in Maths B may be better for the students OP than an SA5 in Maths A, but that might mean not getting their QCE because they need the 4 credits, or they don't satisfy the numeracy component of the QCE. This in turn will affect the schools data (% of students receiving a QCE), and data monster has become more important as different groups try to "measure" schools and teachers performance.

   b) Schools encourage students who are failing or close to failing to change subjects more in line with their "ability level" so that they may get a QCE. That is, Maths B to change to Maths A and Maths A to PVM.

Assessment generally does not support valid and reliable judgements:

The bulk of the Mathematics Syllabus itself is not a problem. It is the "Standards" that are a dramatic "fail". I, and many maths teachers can live without marks, and standards may in fact be easier set without marks, just not the standards in this current syllabus. Some issues include:

- Many good maths students are let down by their English comprehension ability.
- Look at the assessment examples provided on the QSA website and realise the confusion between writing assessment and applying the standards.

- A student's response may show different attributes from the standards at different levels and this leads to confusion about what to give that student. The safe option is to mark the student's response and give the subjective result.
- Complex non-routine is considered to be A standard in Maths B in Modelling and Problem Solving but no mention in Knowledge and Procedures, this is opposite in Maths A, why?
- Collating the information from the standards and then ranking the students onto SAI's (where QSA wants numbers) can be extremely difficult, and different between schools leading to less reliable SAI's between schools. QSA provides no support on how this may be done but simply states "it is up to the school".
- Panel meetings have motto of "when in doubt, trust the school". As a panellist, I am often in doubt because of the hard to understand syllabus standards, thus panel can end up just agreeing.
- Panel training is more about the panel process. It fails to ensure that panellists have a common understanding of the syllabus standards. For example: Some teachers on panel believe from the below Knowledge and procedures that: C standard = simple routine questions, B standard = complex routine, A standard = simple non-routine. Others believe that: C standard = simple routine questions, B standard = simple non-routine, A standard = complex routine. No mention is made on complex non-routine but it is suggested by some that this would demonstrate a high level A student. Who knows?
- Below is a copy of the Maths B standards with words underlined in order to help students realise what evidence they need to show in their responses. Students struggle to understand what is required of them from this and just try explaining it to parents. Parents just look at you and say "umm, ok".
- Writing the assessment item to match the below standards is an extremely difficult process. I average a full weekend of work to write an assessment item in order to ensure it matches the attributes I wish to assess and I and the students can fully understand what is required.

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15 years teaching Senior Maths and 8 years on Maths A and B panels.

Instrument Specific Criteria Sheet - Standards associated with exit criteria

Criterion	Standard *A*	Standard *B*	Standard *C*	Standard *D*	Standard *E*
Knowledge and procedures	The student work has the following characteristics: • recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations	The student work has the following characteristics: • *recall, access, selection of mathematical definitions, rules and procedures in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations*	The student work has the following characteristics: • recall, access, selection of mathematical definitions, rules and procedures in routine, simple life-related or abstract situations	The student work has the following characteristics: • use of stated rules and procedures in simple situations	The student work has the following characteristics: • statements of relevant mathematical facts
	• application of mathematical definitions, rules and procedures in routine and non-routine simple tasks, through to routine complex tasks, in life-related and abstract situations	• application of mathematical definitions, rules and procedures in routine or non-routine simple tasks, through to routine complex tasks, in either life-related or abstract situations	• application of mathematical definitions, rules and procedures in routine, simple life-related or abstract situations		
	• numerical calculations, spatial sense and algebraic facility in routine and non-routine simple tasks through to routine complex tasks, in life-related and abstract situations	• numerical calculations, spatial sense and algebraic facility in routine or non-routine simple tasks, through to routine complex tasks, in either life-related or abstract situations	• numerical calculations, spatial sense and algebraic facility in routine, simple life-related or abstract situations	• numerical sense, spatial sense and/or algebraic facility in routine or simple tasks	
	• appropriate selection and accurate use of technology	• *appropriate selection and accurate use of technology*	• selection and use of technology	• use of technology	• use of technology

Criterion	**Standard *A***	**Standard *B***	**Standard *C***	**Standard *D***	**Standard *E***
Modelling and problem solving	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and analyse problems to develop responses from routine simple tasks through to non-routine complex tasks in life-related and abstract situations	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and analyse problems to develop responses to routine and non-routine simple tasks through to routine complex tasks in life-related or abstract situations	The student work has the following characteristics: • use of problem-solving strategies to interpret, clarify and develop responses to routine, simple problems in life-related or abstract situations	The student work has the following characteristics: • evidence of simple problem-solving strategies in the context of problems	The student work has the following characteristic: • evidence of simple mathematical procedures
	• identification of assumptions and their associated effects, parameters and/or variables	• identification of assumptions, parameters and/or variables			
	• use of data to synthesise mathematical models and generation of data from mathematical models in simple through to complex situations	• use of data to synthesise mathematical models in simple situations and generation of data from mathematical models in simple through to complex situations	• use of mathematical models to represent routine, simple situations and generate data	• use of given simple mathematical models to generate data	
	• investigation and evaluation of the validity of mathematical arguments including the analysis of results in the context of problems; the strengths and limitations of models, both given and developed	• interpretation of results in the context of simple through to complex problems and mathematical models	• interpretation of results in the context of routine, simple problems		

Criterion	Standard *A*	Standard *B*	Standard *C*	Standard *D*	Standard *E*
Communication and justification	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions from simple through to complex and from routine through to non-routine, in life-related and abstract situations	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions in simple or complex and from routine through to non-routine, in life-related or abstract situations	The student's work has the following characteristics: • appropriate interpretation and use of mathematical terminology, symbols and conventions in simple routine situations	The student's work has the following characteristics: • use of mathematical terminology, symbols or conventions in simple or routine situations	The student's work has the following characteristics: • use of mathematical terminology, symbols or conventions
	• organisation and presentation of information in a variety of representations	• *organisation and presentation of information in a variety of representations*	• organisation and presentation of information	• presentation of information	• presentation of information
	• analysis and translation of information from one representation to another in life-related and abstract situations from simple through to complex and from routine through to non-routine	• analysis and translation of information from one representation to another in life-related or abstract situations, simple or complex, and from routine through to non-routine	• translation of information from one representation to another in simple routine situations		
	• use of mathematical reasoning to develop coherent, concise and logical sequences within a response from simple through to complex and in life-related and abstract situations using everyday and mathematical language	• use of mathematical reasoning to develop coherent and logical sequences within a response in simple or complex and in life-related or abstract situations using everyday and/or mathematical language	• use of mathematical reasoning to develop sequences within a response in simple routine situations using everyday or mathematical language		
	• coherent, concise and logical justification of procedures, decisions and results	• coherent and logical justification of procedures, decisions and results	• justification of procedures, decisions or results		
	• justification of the reasonableness of results				