Executive Summary

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The Problem

- Assessment in Qld is virtually unique in the world and has been contrived by University Education Theorists. It is an experiment on our children.
- The QSA has failed to demonstrate the system is a world leader as it constantly claims.
- Qld teachers are forbidden to use marks and add them up to give a final result. The system is opaque and is extremely time consuming for teachers to implement. Queensland teachers must base their final result on a matrix of perhaps 30 individual letter grades. They must make an "holistic judgement", which is a fancy word for a guess.
- Because marks cannot be used, students have no idea of the "worth" of an assessment item and cannot apportion time appropriately.
- In some schools, EEIs and other assignments are grossly overused; the write-ups often exceed 5000 or even 10000 words, turning these subjects into de-facto English classes. Any motivational experience of doing some cool Physics or Chemistry in the EEI is destroyed by the long write-up. This is a major disincentive for students talented in these subjects.
- The QSA has consistently refused to listen to criticism and will not change its philosophical approach to education. It is highly autocratic and will not hesitate to victimize those who oppose it.
- Widespread fear exists amongst teachers, and especially parents, and will be a major barrier to the Inquiry's ability to ascertain levels of support/opposition.
- Standardized tests indicate that Qld performance in Mathematics is very weak, especially at year 10 level, and that QSA assessment for year 11/12 is unreliable.

The Solution

- The QSA needs a major overhaul from the Board of Directors down to the middle managers.
- With the introduction of the National Curriculum, QSA's role can be greatly reduced.
- A permanent parliamentary standing committee is required to review educational matters.
- A marks based assessment system should be introduced, modelled on those used in other Australian States. This should also apply to the primary and lower secondary systems.
- Consideration should be given to the introduction of an external exam, worth perhaps 30% of the total assessment.
- EEIs should be reduced in number and size and become motivational tools. Write-ups should be reduced to a few hundred words and be in the conventional scientific style. Assignments in maths should be stopped.



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Work Experience

School Teacher 1982-3. Blackheath and Thornburgh Colleges, Charters Towers.

Experimental and Research Scientist 1984-88, 1991-2. Australian Institute of Marine Science.

University Academic: 1989-91, 1992- present

Research Interests: Environmental Physics, Electromagnetics, Geophysics. 60 publications in international journals

Engineering and Science Consulting: University Environmental Physics Consulting Unit. Grossed over \$4M in the last 5 years.

Education experience: Registered School Teacher. University lecturer specialising in electromagnetics, oceanography, and the teaching of physics to students with substandard mathematics backgrounds.

Personal background influence: all of my secondary education was in Queensland (Innisfail SHS). The standards and rigour of maths and numerical science was very high. All syllabi were clear, and all assessment items were clearly stated from the start. We students knew what had to be done, we knew the value of each item and we knew how the results of those items were combined to produce the final subject result. The subject results were calibrated using the state-wide ASAT test. We went forward in life with a firm foundation.

It is painful to see how far down our school system has dropped; according to a recent report, in the '70's we were the best State in Australia, now we are the worst. I have also had to watch my children and their friends suffer under the appalling assessment regime mandated by the QSA. Despite having a keen interest in high school education as part of my duties as a university educator, in the end it was watching my children suffer that galvanised me to raise awareness of the shortcomings of the QSA.

Issues:

In order to consider the Terms of Reference, it is necessary to look at the following issues:

- (a) overuse of long writing assessment tasks,
- (b) unclear and unreliable assessment systems,
- (c) QSA's incompetence and intolerance to criticism, and
- (d) the ideology of education theorists.

(a) Over use of long writing tasks in assessment:

The QSA mandates the use of long written assessment (EEIs, extended experimental investigations, and ERTs, extended response tasks) in Physics and Chemistry, and assignments in Mathematics despite these subjects being fundamentally about calculations rather than writing. In many schools these assignments are between 5000 and 10000 words long (10 to 20 pages).

- Some students have 6 major assignments running at the same time.
- The pressure on students is crushing. Figures of 70+ hours per week are quoted to me by parents.
- Unfortunately, the time spent does not develop the skills appropriate for the subject, and needed for university engineering, maths and physics. These university disciplines do not value this long written assessment (first year university experimental write ups are relatively small, and students are penalised if they exceed the prescribed number of words). It would be far better if school students worked on numerical problem solving plus short experimental write-ups in the normal (concise) scientific style (NOT long essays).
- The criteria and instruction sheets for these assignments are often 10 pages long.
- The QSA has been totally inconsistent about the length of these EEIs etc. The syllabus says 1500 words, but the exemplars on the QSA web sites have been up to 6000 words (until they took them down after this was pointed out last year).
- Teachers frequently report that it is impossible to cover all the necessary criteria in 1500 words, so it is necessary to break the QSA rules in order to get a good mark.
- The QSA has not been enforcing its own rules on word length.
- The time spent on assignments, EEIs and ERTs, often leaves insufficient time to master the fundamental knowledge of the discipline (required for university).
- Assignments are given in Maths. They sometimes take weeks or months to complete. Meanwhile, little actual teaching occurs, and the students do no practice questions at home. Assignments in Maths are now being done in lower secondary schooling as well and will further reduce standards to Year 10 exit.
- Some EEIs in some schools are ludicrously ambitious, requiring 3rd year university knowledge. Consequently, little is actually learnt except how to copy from Google.

- Cheating for EEIs and ERTs etc. is rampant. How can the teacher determine if the student, his/her parents, or a tutor did the write-up? In response, QSA suggests students do even more writing by producing log books or journals as well as the long assignments. However, this still does not solve the problem of authenticity.
- Overuse of assignments means that students from comfortable middle class backgrounds with well-educated parents, and a working computer at home, have an unassailable advantage over students from poorer backgrounds. This is due to the extra assistance that can be given for the assignments which have become the dominant form of assessment. Is this fair?
- The original idea of the EEIs was a motivational tool, i.e. do some cool physics, chemistry or maths. However, due to the extreme write-up requirements, the EEIs are often hated. They actively disengage and victimise students who might be very talented at quantitative science or maths, but are ordinary at writing. Many great scientists have not been strong writers. For example the Nobel Prize winner, Neils Bohr, had considerable trouble writing. Three days to produce a 700 word paper was, for Neils Bohr, great haste. But he was one of the greatest ever theoretical physicists. He would have failed lamentably in QSA's Queensland.
- EEIs, ERTs and assignments are largely de-facto English writing tests. If we want to know a student's ability at writing, we should look primarily at their results in English classes.

(b)Unclear and unreliable assessment system

Queensland has an almost unique assessment system that does not use marks. Instead, individual questions in exams, and different components of assignments are given a letter grade. An holistic judgement is supposed to be used to get the final grade (see table 1).

When all the assessment outcomes are known there has to be some method of reaching a final subject 'result'. However the teacher/school has no numbers, only letters. The only people that I know of who think that they can add up letters are educationists in Queensland. Consequently:

- This system of determining the final grade is unreliable because it is not and cannot be properly defined.
- The "holistic judgment" is highly subjective. Different teachers will get a different result, especially if there is a wide divergence of letters in the matrix.
- The QSA has failed to demonstrate that its methods are more accurate than the more conventional method of adding marks.
- The non-marks based system is enforced in all subjects and in all grades.
- All games, be it League, AFL, Cricket or Billiards, have very precisely defined rules and scoring systems. All players, parents, administrators, spectators, commentators and backers know, for example, that a try in League is worth 4 points, but a field goal (which is precisely defined) is only worth one point. Students in Queensland are 'playing a game' of much more significance than that. There is no indication of the worth or value of anything, no clear method of reaching a set of results for any given piece of work, and absolutely nothing at all on how to get the final subject result over the two years.
- Inevitably, due to the hopelessly vague system, there are continuous arguments between teachers and the panels about how to apply the system. The syllabi have a dozen pages of detail explaining how they should be applied, but it is still unclear.

- The irony of the system is that once the teacher has determined the rank order of all the students without using marks or numbers, as instructed by the QSA, the QSA itself inevitably has to use a purely number and marks based system to calculate the OP. Why do they force teachers not to use marks when they know that they themselves will use numbers to calculate the OP?
- The non-numerical assessment system means that students cannot prioritise time, because the question "What is this EEI worth Miss?" has no meaning. A student cannot tell if the EEI is worth 5% or 50%, and thus cannot determine if more (or less) time should be spent on other assessment. A consequence is that students often labour away at pointless assignments, and totally fail to do the technical practicing that is essential for maths and numerical sciences.
- The QSA often claim that teachers can still use marks. This is deliberately duplicitous, and they have never explained how this can be done. They obviously lie about this because they can see that in the eyes of the public, marks are a logical way of aggregating assessment. They can attempt to discredit opponents by falsely claiming that marks can still be used.
- Many teachers break QSA rules and use marks on the sly. Once they have the final grade using marks, they fill in the required paperwork to justify what they have done.
- Whilst the QSA forbade the use of marks by schools, it ran its own external exam system (for certain schools) where marks were universally used. When the hypocrisy of this was pointed out to them, they decided to cancel the external exam option for the special schools (phasing out by 2015).
- In an informal survey that I conducted of over 400 maths and science teachers, the overwhelming majority (90%) found that the non-marks based system was difficult and frustrating to implement and was extremely time consuming. Many teachers have reported that their marking load has become crippling, and this takes away from time that can be devoted to being a good teacher.
- A survey done by the QIEU published on 5th March 2013 found that less than half of maths and science teachers were confident that the QSA process delivers accurate results. Less than 30% said they had enough time to implement the system.
- It is disappointing to note that the effect on teacher workloads has, until recently, been ignored by the teachers unions. The QIEU has recently surveyed some of its members which is the first data that we have on this matter. The QTU continues to ignore the pleas of its members to investigate this issue and acts as if there is no problem. Union leaders have, on occasions, attacked the messengers.

(c) The QSA is incompetent and intolerant of criticism

- The QSA has completely bungled the introduction of the present Physics, Chemistry and Maths Syllabuses. There have been continuous modifications, changes, clarifications, re-clarifications and reversals. District panels struggle to implement the system because the rules are unclear and varying. Advice from the QSA will sometimes have a disclaimer attached stating that the advice might not be right. At least they get that bit correct.
- An example of such a disclaimer is in a document attempting to clarify some technical terms of the syllabus (the words "complex" and "challenging"). It states "This clarification is not meant to offer a binding definition, nor does it provide the only possible interpretation. It does however offer teachers one definition, around which

there has been discussion and consensus among practising teachers (i.e. state review chairs and panellists and district review panel chairs)." It demonstrates the vagueness of the system when the QSA itself cannot define its own terms.

- The syllabi are supposed to provide guidance on what is to be taught. However, these syllabi contain almost no guidance on content. Unlike previous syllabi and those in other states, there is no list of content or the mathematical detail to which content must be taught. The only potential useful list of content in the physics syllabus carries a disclaimer that the list is neither exhaustive nor even compulsory, i.e. it is a pointless list.
- Consequently, different schools can do almost anything they wish.
- The QSA has never provided evidence that the present system performs better than the system it replaced. Much of it was originally invented in the USA and was rejected after trials. Western Australia adopted a similar system, only to replace it with a more traditional approach three years ago after considerable public outrage and the resignation of the education Minister.
- Gabrielle Matters of the ACER, in a report to the QSA in 2008, suggested that "fusing internal assessment and standardised examinations should not be rejected out of hand", i.e. consideration should be given to using an external exam in conjunction with internal assessment. However, the QSA refuses to even listen to such advice and generally labels any opponents as Dinosaurs.
- QSA has enormous power and they use it. For example, they have recently victimised teachers for speaking out against them. They have created an atmosphere of fear. Even now with the forthcoming parliamentary inquiry, many teachers will be very wary about making public comments. This fear is very real and will be a major obstacle for the inquiry as it may be very hard to get students, parents and teachers to make submissions. I see that submissions can be made confidential. I contend that the inquiry must ensure that the public knows for certain that submissions will be kept confidential. It would be good if the Chair could make that clear.
- Even better would be if employee organisations, whether State or non-State, would come out and declare publicly that no teacher, parent or student would be victimised for their views in a submission.
- At a personal level, I can inform the committee that the QSA has twice made formal complaints to my Vice Chancellor to attempt to silence my criticism of the QSA.
- The QSA is a law unto itself. Parliament set up the QSA, Parliament has trusted QSA, Parliament and the community they represent has been badly let down.

(d) Ideology of the Education Theorists

The problems in the QSA are symptomatic of wider deep seated problem across all our organisations associated with school education. These include Education Queensland, the education faculties at universities and the teachers unions.

The present system of assessment is supported by all these organisations despite none of them surveying what parents, the general public or teachers (QIEU excepted) want.

Other fashionable education trends, such as not drilling and practicing mathematical techniques such as basic multiplication tables or algebra, are the inventions of Education Theorists.

Justine Ferrari, in The Australian newspaper of 10th July 2012, reported that the Australian University ' Deans of Science utterly rejected' the published QSA view of science, and by implication, the Queensland science syllabuses and assessment processes. In this report the Deans' view is that the QSA approach 'fundamentally misunderstands the nature of scientific inquiry'. This is an example of how the entire ideology of the educational theorists, in this case within the QSA, is out of step with the real world.

The present system of assessment might be supported by representatives of the organisations in the Qld education circle, but none of them survey what parents, the general public, tertiary academics, or teachers want.

Response to Specific Terms of Reference Issues.

(a) Ensuring that assessment processes are supported by teachers.

The comments earlier about the absolute power of QSA and the widespread fear that exists amongst teachers and especially parents is a major barrier to the inquiry's ability to get a good 'feel' of the level of support/ opposition throughout the community. Parents are very frightened in case their children are victimised, teachers have to 'keep their noses clean' to protect their professional prospects. The QTU is nowadays a part of the Establishment and hence of little value in this matter.

(b) Student participation levels.

Participation levels (and success and standards) are not determined in Years 11/12. The decisions to take/not take a subject are made in Year 10. Although early secondary and primary stages are outside the ambit of this inquiry, the significance and importance of earlier years cannot be ignored. The previous government, seeing the poor NAPLAN results as a 'wake-up call', employed ACER, the highest and most authoritative education research organisation in Australia, to do a study on Primary and also early Secondary education. It is called *A shared Challenge* (ACER 2009). A summary of the situation in Maths in Queensland is: "the absolute decline in lower secondary school mathematics achievement appears to have been greater than in any other State, and have been the **equivalent of about two years learning".** Axiomatically, that appalling decline has a massive effect on enrolments and standards in Year11. Action of a radical nature is needed.

(c) Unclear and unreliable assessment systems.

Any examination of past first year university maths and science examinations shows a very large decline in standards. This has been compelled by the clear decline in knowledge on entry.

Research by Dr Shaun Belward of the JCU Mathematics Department demonstrates, in a rigorous analytical manner, that the standards of students on entry to university are feeble, especially in Arithmetic and Algebra **at the Year 10 level, i.e. students entering first year university with a sound achievement in year 12 maths B struggle with year 10 level mathematics.** This research destroys absolutely any idea that the QSA 'system' is reliable.

What needs to be done?

Western Australia is a good guide. As mentioned above, until three years ago WA had a similar system to Queensland. There was such a public outcry about the system that the previous Labor minister of education was forced to resign. Western Australia has modified its system to a more traditional approach. Importantly, they have also reduced the power of educational theorists. I strongly recommend that the Education and Innovation Committee invite Prof Igor Bray, from the Physics Department at Curtin University, to describe the Western Australian experience.

I have the following specific recommendations:

- QSA syllabi in Maths, Physics and Chemistry need to be rewritten with more detail about the content that is to be taught. This must be done under the guidance of industry representatives (e.g. Institute of Engineers) and university academics in the relevant disciplines (Physics, Chemistry, Maths, Engineering, Medicine etc.). Note: academics in the university education faculties (educational theorists) should generally be ignored.
- The QSA and other education organisations, such as the Queensland College of Teachers (QCT), need more input from discipline experts and less from education theorists
- A marks based assessment system should be introduced, modelled on systems in other States. This system should also apply to primary and lower secondary schooling.
- Consideration should be given to an external exam for some fraction (perhaps 30% or more) of the assessment.
- The option of a state-wide repeatable external exam for certain schools should be reintroduced and extended so that the option can be taken by any student at any school.
- EEIs should not be worth more than perhaps 10% of the assessment. Their primary purpose should be as motivational tools. Write-ups should be considerably shortened. Assignments in mathematics should be scrapped.
- The QSA needs a major overhaul from the Board of Directors down to the middle managers.

- In any review of the QSA, consideration should be given to the effect of the National Curriculum. School subject syllabi to Year 10 exit are no longer the QSA's responsibility, and QSA involvement will become greatly reduced aside from its role in assessment. Ultimately, syllabi to Year12 will also become part of the National Curriculum and the QSA's role will to a great extent be redundant.
- There should be careful and continuous oversight of the QSA by a parliamentary standing committee for school education.
- I encourage the Committee to take a wide view of the issues and examine the low **standards** in Maths and the Numerical sciences over the whole of schooling, and to what extent fashionable syllabi and pedagogy are responsible for the low standards throughout.

Attachments: Example of QSA and traditional grading systems.

1/3/13

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Name: Billy Blogs						
Black Stump Catholic Independent Girls State High School.						
Physics:						
Semester	Assessment Task		Knowledge, Conceptual Understanding	Investigative Processes	Evaluating and Concluding	
1	F	Extended response task (ERT)	C+	C+	A	
1	F	exam	D	С		
1	F	exam	D	C	С	
2	F	Extended experimental investigation (EEI)	C+	C+	C+	
2	F	exam	С	D		
2	F	exam	С	A	A-	
	Monitoring (does not count)		С	С	В	
3	S	Extended response task (ERT)	A	A-	A	
3	S	exam	D	C	A	
3	S	Exam	С	A+	A	
3	S	Extended experimental investigation (EEI)	A+	A+	A	
	Verification		C+	A-	Α	
4	S	Exam	C+	C	В-	
	EXIT		С	В	Α	
	F	INAL OVERALL RESULT	B-			
	Rank	Order for OP calculation	57 th out of 169 students (Calculated by guesswork)			

Table 1: QSA system of aggregating results: The results matrix is used to make an "holistic judgement" of the final result. This sheet was based on a real students result matrix. How the school is supposed to determine the rank order (57th out of 169) from these matrices is anybody's guess. Many schools illegally use marks.

Small Test/ 20	14
Practical/15	12
Assignment/5	4
Exam/ 60	43
Final Percentage	73%
Final Grade after consultation with district	B
Panel	

Table 2: System used in most of the rest of the world. Marks are added up and the final grade is judged by analysing the difficulty of the assessment. Rank order for OP calculation is a trivial task, i.e. just look at the final percentage.