

**The Parliamentary Inquiry into Senior
Mathematics, Physics and Chemistry
Assessment**

'Wherefore by their fruits ye shall know them'

A Submission

By

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Brief Summary

- **Assessment system at Year 12 exit was very sound in, say, 1980. It is now exceedingly poor; there is no Validity, no Reliability and subject syllabi show almost total lack of Definition. Subjects are divided into education speak sub sets, that lead to the farce that a student can get a question right and only get a C. There are various ‘assignments’ under various names that use huge amounts of time, are grossly verbose and over emphasise the students mastery of English rather than Maths/Science.**
- **There are no numbers used in assessments, only letters. Hence there is no clear method to reach the final assessment (only numbers can be added). There is no indication of the importance of a piece of work. Time management is impossible.**
- **Workloads on the students are shocking. In industry they would be illegal. That is caused by the non-stop stream of assignments in all subjects. (Little ‘normal’ teaching takes place in many subjects.)**
- **Knowledge levels on exit are feeble at best, many/most students are hopelessly unprepared for further study in numerical Science, Mathematics or Engineering.**
- **Assessment system is now sexist, being discriminatory against boys by about two OP rungs. That is almost certainly due to (a) the rise of assignments that emphasise English rather than Maths/Science and (b) Eccentric subdivision of disciplines which further de-emphasise actual Maths/Science. See first dot point.**
- **Participation levels notably in rigorous Maths and numerical Science are poor. Alterations to Senior syllabi have little or no effect. Cause of poor enrolments in those subjects is the abysmal condition of Maths and Science up to the end of Year 10. That is when students decide whether to take or not to take a subject.**
- **Queensland once had the highest standards of Maths and Science in Australia. We are now the weakest. Standards at Year 10 exit are very poor, notably in Algebra (below global average.) Very few students reach ‘Advanced’ standard on Trends in Maths and Science Study TIMSS. Australian Council of Educational Research ACER states that Maths standards have declined by ‘two years learning’ by the end of Year 10. Science in lower secondary school is almost totally descriptive – pre Newtonian.**
- **The degradation of education in Queensland has been caused by The Education Establishment TEE. That consists of The Queensland Studies Authority, Tertiary education Faculties, some sections of government Education Departments and the Queensland Teachers Union. Mention must also be given to the feeble old Queensland Schools Curriculum Council which oversaw, and was responsible for, the ruination of education up to Year 10.**
- **The weak education received by our children is the inevitable bad fruit of the rotten tree that is the TEE, especially the QSA and Education Faculties.**
- **Only Parliament can remedy the situation. Modern thinking by ACER, other country’s experiences and groups such as Grattan point the way forward.**

Teaching experience since 1961.

Head of Maths, Okrika Grammar School, Eastern Nigeria 1961-63

Head of Maths Department, Stepney Green Comprehensive School, Stepney, London 1963-65

Senior lecturer Maths/Maths method, Women's Training College, Kano, Northern Nigeria 1965-1968

Head of Maths Department, Tulse Hill comprehensive school, Tulse Hill London, 1968-70

Head of Maths, Innisfail State High School, Innisfail, Queensland. 1970-retirement.

Experience, research and activities relevant to this Inquiry.

- Involved in school based assessment from its start in 1973
- Co-Author with Santo Russo of *Queensland Maths* series Years 8-10, Oxford U.P.
- Long-time member of the Moderation Committee Board of Secondary School Studies BOSSS and Board of Senior Secondary Schools Studies. Brisbane. (The Acts of Parliament that set up both the BOSSS and BOSSSS mandated that there should be a Moderation Committee answerable to Parliament. The Act setting up the Queensland Studies Authority did not so mandate; in my opinion a serious error).
- Innisfail SHS was a Pilot school for Maths A/B and C
- Inaugural District Panel Chair Maths B/C
- Over 6 years I studied under Prof. Mal Heron for a PhD. That was awarded in 2004. Thesis topic was *Participation in Physics and rigorous Mathematics and a consideration of educational, economic and political influences.*
- Since retirement I tutor all Maths, Physics, Ancient and Modern History, Study of Religion and junior Science, for, on average, 12 hours per week.
- Made submissions to House of Reps Education Inquiries and to Queensland examination of standards of Science, Maths and related Engineering and Tech. studies.
- Made representations re weak maths/numerical science to Ministers at two cabinet meetings in Innisfail.
- Author for Online Opinion since 2005. 15 articles about education particularly Maths and numerical Science education in Queensland. Total length > 30000 words. Three recent relevant articles were: *No secondary mathematics foundation under tertiary engineering structure* (18/10/2011), *Through measurement to knowledge* (21/02/2012) and *Education sexism in Queensland* (26/04/2013)
- Moved an E-Petition (see page5) which was presented by Mr Warren Pitt calling for the setting up of a Parliamentary Inquiry into Maths and Numerical Sciences Education in schools.

E-Petition moved by me through Hon Warren Pitt, MLA Mulgrave.

TO: The Honourable the Speaker and Members of the Legislative Assembly of Queensland

Queensland residents draws to the attention of the House to the weakness in student educational outcomes, in particular the relatively poor performance of the more gifted third of the cohort, to the verbose, jargon ridden and weak Queensland Studies Authority subject syllabi and to the opaque, unclear, manifestly unreliable and socially discriminatory assessment systems. Your petitioners furthermore draw the attention of the House to internal school structures that frequently fail to challenge stronger students in lower secondary school and to the consequential gap between years 10 and 11 that adversely affects enrolments in more intellectually rigorous subjects in those final years.

Your petitioners therefore request the House to initiate forthwith an Inquiry into school education in Queensland. That inquiry to include, but not be restricted to: an examination of QSA subject syllabi and their associated assessment structures especially at secondary level to ascertain whether they ensure and guarantee a high level of rigour in all schools across the State, to consider to what extent the overwhelming use of assignments which have dubious provenance can be reliable and fair notably to students from lower socio economic backgrounds or to males. The inquiry should also consider whether assessment systems and methods used to determine a student's Level of Achievement can, in the absence of any indication of the value of a piece of assessment, be comprehended by students, parents, the public or the parliamentarians themselves. The inquiry also should consider whether internal school organisational arrangement provide adequate challenge to gifted students.

Comment on Inquiry and Terms of Reference

As can be seen in my e-petition above I called for a Parliamentary Inquiry into the *whole* of education in Queensland's schools. That was what I had been calling for in a number of my OLO articles for many years now.

Consequently I was pleased to see that an Inquiry was to take place but am disappointed that the Terms of Reference are so restrictive, so narrow. I do not understand why the government decided to have this Inquiry and yet also state that 'The broader senior assessment system (the Overall Position or OP system), and the operation of the Queensland Studies Authority – the body charged with setting the assessment methods – are not in scope for the Parliamentary Committee's inquiry. The government has announced its own reviews in respect of those'.

I am most grateful to the Inquiry and the Members for the opportunity to make this submission.

I sympathise with the Inquiry members. It is going to be very hard for them to deal just with the issues emanating from the Terms of Reference as listed and pretend everything else can be ignored.

I shall certainly find it impossible to avoid noting some of the far wider issues in this submission. Of course it is impossible to separate an assessment system from the subject syllabus itself. It is impossible to separate what happens in Years 11 and 12 from all that has happened in the previous 10 years. It is also impossible to separate what happens in

Maths/numerical Science in Years 11/12 from all the other subjects that any student is struggling with at the same time.

I hope that that will not invalidate the submission and that the Inquiry membership will take a generous view/interpretation of the Terms of Reference.

Brief summary of my opinions on the specific Terms of Reference.

(1) TOR 1. Ensuring assessment processes are supported by teachers.

That will probably be impossible to establish. It is *essential* that the Inquiry members realise and accept that fear is the great driver of what is happening. Teachers tell me that they do not approve of what is happening, but I expect that none of them will put in a submission – even with the promise of anonymity. Associated with the teacher fear is student and parent fear. The fact is that there is a vast disparity of power between the QSA/school/teacher on the one hand and the student/parent on the other. All the students are trying to do - with the backing of the parents – is get results and an OP to enable them to progress to university or elsewhere. They are frightened that if anything is said the student will be overtly or covertly penalised.

(2) TOR 2. Student participation levels.

I shall demonstrate that the new syllabi have not produced any improvement in participation levels. That is of no surprise as the decisions to take or not take a subject are made at the end of Year 10. Participation levels remain low; a fact that will lead to staffing problems in the schools and major problems at the tertiary level.

(3) TOR 3. The ability of assessment processes to support valid and reliable judgements of student outcomes.

This is one issue that can be and should be judged from the outside, i.e., by the consumers. There is no doubt that standards, of mathematics in particular, on entry to university is a total and complete disgrace. Any other industry that produced such poor quality outcomes would either go broke if private enterprise (and probably face legal proceedings by defrauded consumers) or be dismissed forthwith by governmental employers. Would the Parliament, the Government or the people at large put up with, say, ERGON, if the voltage was unreliable, they failed to state what the voltage should be, or the power available, or the frequency of the current, and if all of those criteria were at a much worse level than twenty years earlier? Heads would roll.

The dreadful standards at the end of Year 12 are merely a continuation of the known abysmal standards in Primary and lower Secondary schooling. Radical change is required forthwith.

Expanded remarks on the issues above.

(TOR 1) Ensuring assessment processes are supported by teachers.

It is always hard to get teacher or student opinion because of fear of exposure. Whilst working for my PhD I surveyed a randomly selected 100 strong sample of school Principals. I constructed the whole thing so that I could not possibly know who a given response came

from and, more importantly, the Principals could see that I could not know. I got a 70% response. Not only did they respond to the specific questions but many volunteered substantial comments. Those response and comments are available from JCU. The Thesis is/was called (see full title given on page 4) *Participation in Physics and rigorous Maths* JC Ridd 2003. I also surveyed a large number of Year 12 Maths C students and again obtained a high response rate. Those results and comments are also in the Thesis. **Note that the response was excellent solely because privacy was certain.** In the absence of the **perception** of such certainty I fear that there may be reluctance by students and parents in particular to participate in this Inquiry – but I hope I shall be proven wrong.

(TOR 2) Student participation levels, the numbers. The issue here is the number of students taking the named subjects Maths, Physics and Chemistry. In particular Maths C and Physics have been, are, and I suspect will be major concerns.

It cannot be overemphasised just how unfortunate it is that the TOR limits the Inquiry to Years 11/12 and assessments in those subjects. The undeniable fact is that participation levels (and probability of success in those subjects) are determined by the end of Year 10.

The *Longitudinal Survey of Australian Youth number 22* (ACER 2001) showed that the major determinants of results at the end of Year 12 were Numeracy and Literacy **in Year 9** and that Numeracy was even more influential than Literacy. No other possible influence came close to those two. LSAYR 22 was referred to frequently in my thesis.

Student decisions as to what subjects to take, and what not to take, are made near the end of Year 10. They are irreversible so far as Maths B, Maths C, Physics and Chemistry are concerned. Of course some students do start Maths B and drop down to Maths A, but the reverse is not really possible. Students do drop Physics, Maths C and, less frequently, Chemistry for other subjects altogether, but again any reversal does not happen.

By the end of Year 10 our students are very seriously disadvantaged by their pathetic Maths standards, notably Algebra ‘the gateway to further Maths’. Furthermore the Science up to Year 10 exit is painfully weak in the numerical sciences Physics and Chemistry. Lower Secondary Science is essentially non-numerate; pre Newtonian.

Although it is outside the Terms of Reference I consider it essential that the Inquiry members examine ‘*A Shared Challenge*’ (ACER 2009) which was done at the behest of the previous government. It is a truly devastating document. For a briefer, perhaps more easily read source of information on this issue members and their advisers might read my *Through measurement to knowledge* at www.onlineopinion.com.au/view.asp?article=13273

However although then Premier Bligh talked about the poor NAPLAN results being a ‘wake-up call, the feeble results should have come as no surprise. The problem was known over a decade earlier. A high quality piece of research *Maths as a Foundation* was done at the end of *last century* that emphasised the Maths weaknesses in Year 10 and the inevitable problems in Years 11/12. Not only was that research report known to the then BOSSSS, who did the research, but also known to the then Queensland Schools Curriculum Council QSCC, who asked BOSSSS to do the work (QSCC never did any research or assessment at all so had no ability to do the research). When the QSA was set up they took over all of the BOSSSS and QSCC. They surely must have known. But it gets worse, a copy of the document was, I am

fairly sure, put into the Parliamentary library. For the sad tale of good research ignored or thrown away please read my *Degenerate maths and the mystery of the disappearing report* at www.onlineopinion.com.au/view.asp?article=10058

Any examination of ‘student participation levels’ must go to the actual numbers. As a part of my PhD I examined male, female and total participation rates in Physics, Maths C etc. I have, in haste, tried to extend some of that work up to 2012. Although I think I have got it right I have no time rigorously to examine my work. The first table shows enrolments in Physics and female number and percentage (to the nearest whole number). There is a major problem in working with the Physics numbers as there have been so many changes of syllabus: a 1987 syllabus, then 1995, 2001, 2004 and 2007. The data for many years contains numbers for two different syllabi. The following are the best I can manage.

Table 1. Data for Physics enrolments (4 semesters)

	1992	1994	1996	1999	2000	2004	2006	2010	2011	2012
Total	6137	5813	5489	6127	5987	5893	5551	5606	5676	5805
Female	1765	1681	1695	1736	1722	1702	1636	1555	1535	1494
Female %	28	29	31	28	29	29	29	28	27	26

The slow erratic decline is evident. There is no real indication that any of the many syllabus changes over the twenty years has had much effect. Taking the twenty year period as a whole there is no sign whatsoever of an improvement in female participation.

Also of interest is the percentage of students, notably female students being awarded the various Levels of Achievement. Samples of that are shown in the next Table.

Table 2. Some data for Levels of Achievement. Physics.

	% awarded Very High Achievement	% VHAs awarded to females
1992	13.6	33
1997	12.32	34
2002	13.6	35
2007	14.8 approx. 2 syllabi operative	38
2009	16 approx. 2 syllabi operative	39
2010	14.92	38
2011	15.32	37
2012	15.77	34

Over the 20 year period there appears to be a gradual rise in percentage being awarded a VHA. That could be due to the fact that the total numbers taking the subject fell (see Table 1) and perhaps a connected decrease in the number of weaker students. It is also possible that the rise in ‘assignments’ under any name are inflating the results. See later comment on the percentages receiving A + B results in total.

It is probable that the rise of subjects such as 'Technology Studies' will be having some effect on enrolments in Physics and perhaps Maths C. In 2012 1427 students completed 4 semesters of the subject; 1323 were males.

Another practical issue associated with declining enrolments is the worrying downward trend in enrolments per school. For example for Physics in 1992 there were 18.7 students per school. By 2001 it was down to 17.7, in 2005, 15.4, and in the last three years 2010, 2011 and 2012 the numbers were 14.8, 14.9, and 15.0 respectively.

For Maths C the data are: 1992 13.4 per school, 2001: 9.2 per school and 2012: 10.7.

These data imply major challenges for school staffing, especially for smaller schools.

Overall there seems little doubt that jiggling about with the syllabi, making them more in keeping with current education fashion has minimal if any effect on enrolments or female enrolment.

The one thing that is probably associated with syllabus change is the fact that in 1992 Physics only 34.86% received an A or B and 30.75% received a D or E. However in 2012 49.5% of the students were awarded either an A or a B; but only 14.6% received a D or E. So the distribution is much more heavily skewed upwards now than it used to be. It is conceivable, I think probable, that that unusual distribution is in part due to syllabus change; in particular the rise of non-formal exam assessment of dubious provenance in the form of Extended Experimental Investigations EEIs and very lengthy Research Tasks.

The effect of the poor enrolments, allied to weaker standards, is a serious problem for some faculties at tertiary level. In particular Engineering has a massive problem. Australia is not producing enough engineers, but the universities are struggling to find enough capable student. I refer you to my: *No secondary mathematics foundation under tertiary engineering superstructure* at

www.onlineopinion.com.au/view.asp?article=12753

Conclusion

I assert that the problem of poor enrolments in Years 11/12 in rigorous Maths and numerical Sciences is primarily caused by the abysmally low standards of Maths and Science up to Year 10 exit.

(3)The ability of assessment processes to support valid and reliable judgements of student outcomes.

Personal comment: From the start I was a strong supporter of the system developed in the 1970s; it worked and was the best system that I had ever seen (having worked in three different continents). That system has been systematically ruined to the point of now being the worst I have ever seen. I see it now as government sponsored child abuse. So sad and personally very painful.

Section 3 Part (a): Undefined, invalid and unreliable.

In my first Online Opinion article; *Wadderloader! Maths and Science teaching in Australia* www.onlineopinion.com.au/view.asp?article=2963 on January 25th 2005, I made a number of statements:

- That the standards were very low as measured by the Trends in International Maths and Science Study TIMSS.
- That to reach such a degraded level had taken a long time and a ‘perverse sort of skill’.
- That the decline had been perpetrated by what I called The Education Establishment TEE, comprising Boards of Study (QSA in our case), poor teacher training within the Faculties of Education, Teacher Unions ‘who oppose verifiable assessments’ and some ‘trendy (government) Education Departments’.
- That subject syllabi and assessment should ‘ensure that outcomes are **reliable, validated and defined**’.
- That ‘assessment systems are essentially non-numerate, depend on items that may, or may not be, the student’s own work and over emphasise English’.
- That the improvements so badly needed cannot ‘emanate from within The Education Establishment’ and that ‘only Parliaments can produce the improvements.’

Eighteen months later I produced for OLO *Floating gently on a waft of edudribble* www.onlineopinion.com.au/view.asp?article=4539 which summarised what the system was like in the 1970s and why it was good then and how it had been degraded to the point of total unreliability. The following are excerpts taken from the article:

Syllabi for each subject ...provided a sufficiently detailed description of the concepts and material that was to be studied and assessed in each school.

Tests and exams were given regularly. The results of these were normally given as a mark.

Note that:

1. *the subject syllabi were clear, hence ensuring that it was evident to the panel that each school had fulfilled its syllabus obligations;*
2. *the various panels knew the conditions under which the various assessment instruments were done. Their provenance was certain;*
3. *the students knew the worth of each piece of assessment and how the various pieces of assessment would be used to reach their final result - they knew the rules of the game.*

With the rise in the influence of (mainly) university-based education academics all of those three basic requirements were weakened. When the Board of Senior Secondary Schools Studies was abolished and replaced by the Queensland Studies Authority (QSA) what had been a slow decline became a Gadarene leap into disaster.

The newest syllabi are hopelessly short on detail of material and concepts to be studied.

With the rise of “assignments” as both the central teaching approach and for the assessment of results, it is certain that nobody, either panellist or student, can know for certain whose work they are looking at.

Because the modern Queensland assessment “system” is non-numerical the “methods” to estimate final student results are vague, wordy and depend on “overall judgment”. The student has no idea whatsoever as to the relative importance of a piece of work

The basics that made the Queensland assessment system so good years ago were syllabus clarity, certainty that assessed work was that of the student alone and a transparent system to reach the final result. None of those characteristics now exists in Queensland.

The syllabi and assessment systems ..has been spawned mainly by the Queensland Studies Authority.the organisation as a whole floats gently on a waft of edu-dribble. QSA has smashed an adequate system

In terms of student assessment Queensland has moved from excellence to lunacy, from penthouse to cellar.

How are the mighty fallen.

Those early articles were written 7 and 8 years old years ago and things have changed a great deal since then. The situation is far worse especially in Maths and the Numerical Sciences in Years 11/12. The creeping evil of ‘assignments’ under various names has ruined and degraded those subjects.

- Subject syllabi lack any real definition; it is not quite ‘anything goes’ but jolly near it.
- The subdivision of subjects into eduspeak sub-sections most of which have no connection with Maths or Science create chaos. A student can do a Maths question, get it correct and be awarded a C only.
- Assignments under any name have little reliability as to even who did them.
- There is no indication as to the significance of any piece of work. Words such as number, add, weight, value, average are banned – regarded as if they were pure filth.
- Assessment items are awarded a letter, those letters put on a matrix lead, apparently by Divine Guidance, to a final result. That final result is then transmuted, presumably with waving of hands and a puff of smoke, into a number so that an OP can be calculated. There are times, lots of them, when I seriously wonder if people who believe that letters as opposed to numbers can somehow be totalled are the full quid.

I contend that the total necessity that syllabi and assessment systems should be **Defined, Reliable and Valid** is still a fact. I note that the Terms of Reference use both of the words ‘valid’ and reliable’. I also noticed with very great pleasure the Submission to this Inquiry by Stephen Kazoulis. He consistently plugs the words **validity** and **reliability**. They are always in **bold**. However it is equally important that the skills/techniques/content etc to be handled is well **Defined**.

Section 3 Part (b) Weak outcomes, feeble standards, poor preparation for later.

The incredibly low standards, notably of Maths and Science at Year 10 exit are documented with such certainty that even the QSA or Education Faculties will have trouble denying the facts. (But it is dangerous to underestimate their ingenuity in excusing the inexcusable! They certainly will try because clearly the feeble standards are their fault).

Although the desperate situation to Year 10 exit is technically outside this Inquiry's Terms of Reference it is obvious that for sequential subjects, Maths being the classic example, the dreadful student weaknesses at the Year 10/11 interface *must* influence the standards of the discipline that can be done in Years 11/12. Of the staggering number of weaknesses, I consider, and have for years considered, that the two that inflict the greatest damage on the work in later years is (a) the condition of Algebra and (b) the astoundingly small percentage of our children that reach 'Advanced' on TIMSS. (Please see again my *Through measurement to knowledge* listed on page 7 of this Submission). The key points were: firstly that our student's algebra is well below the *global* average (scandalous) and secondly that globally 5% reached 'Advanced' in Year 8 Maths, high performer Hong Kong reached 40%, Australia 9% and Queensland only managed 3%. The small font is sort of whispering! The implications for later studies of these embarrassing performances are obvious.

I tutor many students, mainly years 11 and 12. Almost daily I see the low standards of Maths and numerical Science. Much of Year 11 it taken up trying to do a 'finger in the dyke' job on all the hang over problems. I regularly use old Year 8 texts for simple Algebra. The students and I joke along the lines that 'wow, a Year 9 book today'! Trouble is that it is not funny at all. It is a frequent occurrence that a student can do the new ideas/techniques – calculus perhaps, but cannot finally get the question right because the old foundation work collapses under the strain.

The assignments are an absolute farce. The students learn almost nothing, they take weeks to do and are verbose in the extreme. It is no surprise that what comes out of schools to Maths/Science/Engineering/Technology courses at tertiary level is so feeble. I refer you to statements in submission of Dr Norton (Griffith), Professor Peter Ridd (JCU), Professor Kroese (UQ) and Dr. Dean (UQ) as a mere sample.

The seminal work of Dr Shaun Belward (JCU) is crucial. In that work he demonstrates, with a good sized sample, that the students on entry to Maths courses at JCU *cannot perform even at the Year 10 level*. Even more crushing is the fact that he demonstrates that the tertiary first semester Maths results show that results from Year 12 of Sound as opposed to High Achievement are **not predictors of success rates at university**. It is probable that Belward's results may be as a consequence of the fact that Year 11/12 results can be, and often are, a reflection of how well the assignments were done. We have seen earlier that the increases in the percentages getting Very High and High ratings in Physics may be a consequence of better results on 'assignments' than on rigorously set examinations. Of course the assignments and their results are of zero significance for performance at university Maths.

The consequences of feeble Year 11/12 performance are severe for Engineering. Low down on page 9 is a reference to an OLO article dealing with that issue. The feeble enrolments are a problem, but the poor standards are as well. For a country that likes to think of itself as 'advanced' the clear problems for the production of Engineers are serious and should be embarrassing.

Other issues.

Peculiar subdivisions of subjects.

QSA has subdivided subjects into subsets for assessment purposes. For example Maths is divided into Knowledge and Procedures, Modelling and Problem Solving and Communication and Justification. The only one of those that is definitely Mathematics is the first – Knowledge and Procedures. MPS is in general what I would call Application. It is seen as being more advanced than KP. In terms of difficulty it is possible to have very easy and very hard questions in both KP and MPS. For later work in Maths or the Numerical sciences it is Knowledge and Procedures that are the most vital because they are the Mathematical *tools*. (Ironically QSA type thinking implies that KP is the easiest and least valuable part.) Mathematics is a language. It stands as such; complete. If a question is done showing the mathematical steps then that solution is, without any English words, complete: it has within itself total justification and, being a language, is full communication. The insistence on wordy chatter is not just unnecessary, it is wrong.

There are a number of people who think, or give the impression that they think, that using numbers instead of letters and having an external exam would be a *complete* solution to the problem. That is not so. Of course letters must go, they are a nonsensical idea for assessment; but if an external exam was set by QSA type 'thinkers' it could still be dodgy. The method would/could be to give a smallish number of questions each with a number of parts, perhaps 3 or 5. Each of the parts would or could be assessing one or other of the 'dimensions' or whatever word they might use and then the final result deduced in some peculiar manner as happens now. No, all of that stuff has to go irrespective of anything else.

Appalling work loads

Here again it is not possible to consider assessment in Maths, Physics and Chemistry alone. The work load for a student is the sum of the loads from six subjects. It is that total load that is so dreadful. QSA claim that the assignments, under whatever name are not supposed to be long. That is not what I see day after day after day. Assignment lengths are huge, much more than QSA suggests. Students tell me that the xxx teacher (a science subject) states that an *Introduction* needs to be at least 1200 words long! I have never heard of a student losing marks (sorry!), being downgraded, because the assignment write up was too long. The sum total is that students are labouring away 50, 60 hours a week. How about assignments that go over a holiday as they sometimes do? The other big issues with the long assignments, however defined, is that the students do very few maths/science practice questions – they won't count immediately so don't bother. That further militates against any gain in expertise – the tools.

The vast Extended Experimental monsters use up so much time that there are few other Practicals done at all. Hence they gain almost no idea of how to do a prac, what to look for if things seem to go adrift, where errors may occur. I had some very good students last year who worked together on an EEI. It was woeful. The four of them eventually had OP results that *added* to nine; but for the electrical experiment they had they had not the foggiest. They did not know what I meant by a circuit diagram; they did not appreciate what voltage and current are, they did not note results as they went and none of them understood or even had heard of the simple idea of bad connections. Only a really very poor science education could lead to such profound ignorance and incompetence in such a smart and assiduous group of students. Not the fault of the school. The system is rotten to the core.

Secretive exams.

Exam papers taken by the students are never allowed out of the school(s) so nobody at all can know or judge whether what is good quality or not. I presume that what is happening is that it is hard to make up the weirdo questions that purport to meet all the subdivisions referred to on page 3 and in other submissions. So they hide them and use them again and again. There is a degree of furtiveness that I find disturbing – and suspicious.

Sexist assessment system

Please see my *Education sexism in Queensland* at www.onlineopinion.com.au/view.asp?article=14942 where I contend, using a calibration of QCST results with OP results that the system nowadays discriminates against boys by about two OP rungs. In summary: at present Males get higher QCST results than girls but the girls get better OP results. In 1992 a similar comparison indicates that at that time the discrimination against boys was about one OP rung. However, at that time, in 1992, an analysis of the Physics results showed no discrimination for or against males. In 1992 Physics had not been affected by the assignments (in whatever form). It seems probable that the use of assignments has produced a discriminatory result. When I can get hold of relevant data I will try to rework the numbers for Physics 2012. (Note: I consider QSA's syllabus and assessment material to be dreadful; but the Data Management/Stats people are excellent).

Observation and anecdote both point to the great preponderance of girls receiving academic awards in the schools. That could easily be confirmed or denied by a simple review of Award night documents. Employing authorities should act on this issue forthwith

It should be noted that there is nothing at all new about identifying achievement problems for boys in Secondary education. In 1999, Matters, Allen, Gray and Pitman of the BOSSSS wrote *Can we tell the difference and does it matter? Differences in achievement between girls and boys in Australian senior secondary education* which was published in The Curriculum Journal vol 10 no 2 summer 1999.

Current emphasis on comparison with other Australian jurisdictions

In view of the fact that *all* of Australia is weak in Maths and Science as measured on TIMSS I advocate that Queensland should not try just to do as well or even a bit better than them. We

should aim higher. Let us be guided by what happens in parts of SE Asia, not just try to be the least feeble of the ‘ignorant white trash of Asia’. Aim high please. See *Degenerate Maths and the mystery of the disappearing report* again.

Background to Recommendations.

Modern thinking such as is evidenced, for example, in ACER’s *A Shared Challenge* (2009) and *Measuring what Matters: student progress* Dr Ben Jensen, Grattan Institute, are in complete contrast to that shown by QSA and Education Faculties. Both ACER and Jensen hammer away at measuring, improvement, clear expectations, monitoring performance. (All of those collectively would provide system(s) that met the triple requirement of **Defined, Reliable and Valid**. Some examples:

- ‘All top performing schools recognise that they cannot improve that which they do not measure’.

‘Top performing schools are relentless in their focus on improving the quality of classroom instruction’

- ‘All of the top performing and rapidly improving systems have curriculum standards which set clear and high expectations of what students should achieve

- (Need for) ‘well developed systems for evaluating and monitoring performances.’

- (In high performing Victorian schools) ‘Each of the schools has been particularly active in identifying tests and other assessments which contribute to an objective picture of student achievement and to the determination of the value that the school itself adds, through analysis of trends over time.

(An ACER recommendation) ‘That all aspiring primary teachers be required to demonstrate through test performance, as a condition of registration, that they meet threshold levels of knowledge about the teaching of literacy, numeracy and science and have sound levels of content knowledge in these areas.’ (That is necessary because of the pitiful knowledge levels of many teachers. That *must* be due to reprehensible incompetence within university Education Faculties.)

(Also an ACER recommendation) ‘That standard science tests be introduced at Years 4,6,8 and 10 for school use in identifying students who are not meeting year-level expectations and for monitoring student progress over time.’

All of the above are direct or indirect criticisms of syllabi/curricula and assessments in Queensland or of woeful tertiary teacher training. It should be noted that no government can or should have power over a university. But a government *can* determine whether a graduate from a university is of an acceptable standard to be employed.

Jensen argues for Value Added, a system built on current NAPLAN to ‘*estimate the contributions of schools to student progress in stated or prescribed education objectives*’.

Jensen contends that presently NAPLAN may produce injustice to schools with lower socio-economic backgrounds. (With my background I obviously agree with that and am hence a strong supporter of Value Added.) Jensen also states that value added is more accurate and has been supported by head teachers in UK and is preferred in other European countries; and that Institutions such as teacher unions and school associations in a number of countries have also supported the introduction of value-added modelling as the greater accuracy creates a fairer system, particularly for schools serving more disadvantaged communities.

The unreliability of Year 11/12 assessments in Maths/natural Science and the low standards at Year12 exit have been exposed earlier. Queensland schooling at present suffers from extreme syllabus weakening and a failure to 'set clear and high expectations of what students should achieve'. That is the product of the QSA's subject syllabi and fanciful assessment structures.

Only Parliament can institute the drastic changes needed to syllabi, assessment systems, teacher training and school attitudes because the Queensland Studies Authority, Education Faculties and some government department people think everything is fine and most certainly will not, *can* not, make the sorts of changes required. Their thinking is long out of date and overdue for disposal.

Recommendations

- (1) This Inquiry should recommend to the Parliament and the Government of the day that the combined criteria **Defined, Reliable, Valid** should be a minimum yardstick by which all syllabi/assessments should be judged. Clearly the current 'system' meets none of those criteria and hence must be eliminated root and branch.
- (2) Insert, forthwith, in the Queensland Studies Authority Act 2002, or, preferably the Act setting up a new Authority to replace QSA, a Section or Regulation that stipulates that all subject syllabi must '**set clear and high expectations of what students are expected to achieve**'. Furthermore all assessments systems including the value of all items and method of reaching the final result must be clear, publicly available and understandable to students, parents and Parliamentarians. They must ensure that no group of students is systematically disadvantaged.
- (3) All syllabi should be rewritten for use from January 2014. There should be no assignments under any name or disguise in any Maths or Physics and Chemistry as a minimum. All subdivisions of subjects into 'dimensions' or 'criteria' or any other of a non-Mathematical or non-Scientific nature must be removed totally. Those rulings to be applied over all years of schooling.

- (4) The above must apply irrespective of whether an external subject exam is used in whole or in part for final assessment; that is it must apply to *all* internal and all external assessment.
- (5) In the Sciences there must be a substantial increase in the number of traditional Practicals. Each to be written up in standard scientific manner and brief.
- (6) A permanent standing committee of Parliament for School Education should be set up which should, *inter alia*, sympathetically but rigorously, maintain a watch over subject syllabi and assessment systems. When the replacement for QSA is enacted I strongly suggest that, as a part of that Act it should be mandated that a Committee be set up, the remit of which should be a careful watch over syllabi/assessments. Such committee mandated to report to Parliament annually or earlier if the need arose.
- (7) Accept the ACER recommendation that all aspiring Primary teachers must be able to demonstrate a reasonable level of knowledge in the disciplines of Maths, Science and English. That must be by a formal test set externally (not by QSA) and supervised in a manner not less rigorous than for the Core Skills Test. Suggested minimal achievement should be at NAPLAN year 9/10 standard and 85% pass level.
- (8) Accept and put into action as soon as possible, certainly this year, 2013, Jensen's recommendation that 'The current measures of school performance published in 'My school' website should be replaced with value added measures of school performance, given their greater accuracy and fairness to schools serving poorer communities'. That could be done with or without Commonwealth involvement.

John Ridd,

[REDACTED]

[REDACTED]

Every good tree bringeth forth good fruit; but a corrupt tree bringeth forth evil fruit.

A good tree cannot bring forth evil fruit, neither can a corrupt tree bring forth good fruit.

Every tree that bringeth not forth good fruit, is hewn down, and cast into the fire.

(Matt. 7, 17-20)!!