[redacted]

From: Doug Goldson [redacted]
Sent: Saturday, 9 March 2013 9:55 PM
To: Education and Innovation Committee
Subject: submission to your inquiry into maths and science senior assessment
Attachments: KISS.pdf; QSA is lost.pdf; Assessment workload and standards.pdf

Follow Up Flag: Follow up
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Education and Innovation Committee,

Please accept the three documents attached to this message as a submission to your inquiry into maths and science senior assessment in Queensland schools. The documents are

1) KISS : Keep It a Simple Syllabus (3 pages), written in Dec 2009.
Published in the winter 2010 issue of the Journal of the Queensland Association of Mathematics Teachers (QAMT).

2) Has the QSA lost its way? or (Some concerns about senior syllabuses.) (2 pages) written in August 2010. Published in the QAMT Journal (September 2010) and circulated on the mailing list of the Science Teachers Association of Queensland (STAQ).

3) Senior Assessment, Teacher Workload and Student Standards (4 pages), written in Nov 2010. Circulated on the mailing list of STAQ.

Document (1) make several criticisms of the senior syllabus assessment regulations in Maths B. Much the same objections apply to Maths A.
These are the two senior subjects that I teach and that I have direct experience of. Document (2) has some relevance in understanding the context in which document (3) was written. The latter is a summary of an informal survey of teacher attitudes to senior assessment in maths and science. It is quite representative of the problems that teachers face in carrying out senior assessment, in so far as these problems have been expressed to me by teaching colleagues.

Given that "the terms of reference for the Parliamentary inquiry specify a focus on the assessment methods used in mathematics, chemistry and physics at senior level in Queensland schools" these documents seem to me to clearly fall under these terms.

This is a private submission. My school can be used as a contact address.

Yours,

Doug Goldson.
[redacted]
(T) [redacted]

KISS : Keep It a Simple Syllabus
or
(Heretical Thoughts from the Classroom)

Some time ago I had occasion to write an open letter to the Queensland Studies Authority (QSA); a complaint about the over-complexity of assessment criteria for a Year 9 mathematics QCAT (Queensland Comparable Assessment Task) [1]. My argument was based on a supposition that the QSA is want to embrace unnecessary complexity. Before delving into the particulars of the present article it is worth summarising the earlier argument in its general terms.

The great British scientist C.A.R. Hoare said

> "There is nothing a mere scientist can say that will stand against the flood of a hundred million dollars. But there is one quality that cannot be purchased in this way — and that is reliability. The price of reliability is the pursuit of the utmost simplicity. It is a price which the very rich find most hard to pay."

and it is a commonplace principle of science and engineering that unnecessary complexity is to be avoided at all costs, and that necessary complexity is to be embraced with utmost care. It is my firm belief that the QSA does not follow this principle. Rather, the syllabus designer appears to take complexity as a positive attribute, conferring the imprimatur of sophistication. To the classroom teacher, on the other hand, complexity can only be a negative attribute. Teachers have their feet on the ground, and they are acutely aware of

Psychological fact (PF1): Complex tasks are done less well than simple tasks.

For the classroom teacher like me who is concerned enough about this issue to make an argument against QSA practice, there is the difficult question of how to make the argument. General argument can be countered by general counter-argument of the same sort. Both sides confront each other, but without decision. In this article I choose a different strategy, focusing on a particular case of syllabus design, Mathematics B, in order to make the argument that QSA assessment criteria are unnecessarily complex, and therefore unnecessarily unreliable. It is clear that this strategy involves an implicit induction that, mutatis mutandis, what is true of Maths B is also true of all, or most, of the other QSA subjects.Teachers of other subjects can decide for themselves whether this induction is a valid one.

The rest of this article features a brief description of "Mathematics B Senior Syllabus 2001" [2] (henceforth B2001), "Senior Syllabus Mathematics B 2008" [3] (henceforth B2008), and analysis and comparative analysis of these syllabuses; followed by concluding remarks.

Description of B2001
" Student achievement will be judged on the following three exit criteria:

[EC1] Knowledge and procedures
[EC2] Modelling and problem solving
[EC3] Communication and justification. " (p28)

and "All three exit criteria must be adequately represented in assessment data to enable the overall quality of a student's achievement in each criterion to be determined." (p28). An overall judgment of performance is then obtained using a lookup table (p32). For example, Very High Achievement, requires "Standard A in any two exit criteria and no less than a B in the remaining criterion " (p32). It follows from this that assessment, however organised over an extended period of two years, is to be done by assigning separate grades to a student for each of the three exit criteria.

Analysis of B2001
What is wrong with the above? No maths teachers can doubt the importance of the exit criteria. The problem is not that they are objectionable. The problem is that they are separately assessable. We do well to remember (PF1); by making EC1-3 separately assessable the complexity of the task is increased threefold. It may be objected to this that if criteria are not explicitly assessed then students will not practise the corresponding skills. This is a version of the teacher's concern that 'If it's not on the test, the students wont take it seriously'. My response is that EC3 concerns a skill that is so intimately connected to EC1 and EC2 that it staggers me that anyone should see fit to judge it separately from them. In plain English, when a student does not know very much mathematics and does not reason well in novel mathematical situations then they do not communicate well either ! This makes it redundant to assess this attribute separately from the other two. Further, since 'good communication' is an ineffable attribute it is very hard to judge it reliably. (Here is (PF1) at work again.)

The situation with EC1 and EC2 is similar. Whereas the conceptual separation is unobjectionable, the error is to assume that this somehow justifies a separation of their assessment. What the psycho-meta-mathematical theory boils down to is little more than that (1) some problems are harder than others, and (2) the harder ones are usually harder because they involve some extra level of interpretation that is absent from the easier ones. Sadly, the syllabus distinction of exit criteria, at both the conceptual level and at the practical, assessment level, tends to essentialise the difference between EC1 and EC2 in an unhelpful way, i.e. the syllabus effectively treats them, or causes them to be treated, as defining fundamentally different categories of problem. I have yet to see a justification for doing this. In my world, there are just mathematical problems, and a balanced piece of assessment (and work program) is one that includes problems with a range of difficulty and type. I see no good reason to categorise some as Knowledge and Procedure (EC1) and others as Modelling and Problem Solving (EC2). To do so is to violate

Principle of thinking (PT1) : Do not make unnecessary distinctions.

and so to invite unnecessary staffroom disagreements about which is which.

Remark
A long time ago I read, perhaps in his autobiography, that Bertrand Russell was taught geometry (some time in the late 19th century) from Euclid's 'Elements' (whether in greek, latin or english I do not recall). This tit-bit strikes me as the ultimate vindication of mathematics as a subject of study: its stability. That a theory of geometry should be studied, unchanged, two and a half thousand years after its creation, and using the same text ! Applying the same standard to B2001, how sad that a set of regulations for the teaching of mathematics should be so volatile as to be superceded after only seven years, and how revealing that comparison of B2001 and B2008 shows that the important changes lie only in the tables of "standards associated with exit criteria" ([B2001 pp33-35] and [B2008 pp34-36]). This then is the focus of the comparative analysis.

Standards in B2001 : Knowledge and Procedure
A standard: The student must "consistently demonstrate … appropriate selection, and accurate and proficient use of procedures".

B standard: The student must "generally demonstrate … appropriate selection, and accurate use of procedures". (p33)

Analysis of B2001 KP standards
(1) Nowhere in the syllabus are the key terms "consistently" and "generally" defined ! In my school they are arbitrarily defined as ">= 0.75" and ">0.5". After all, some criterion is required for consistent (i.e. fair) treatment of students. However, the definitions are arbitrary and may well differ from school to school. Why then are we asked to base sharp judgments of standards on fuzzy concepts of consistency and generality ?
(2) Assuming that these concepts are adequately defined, with respect to procedures, the qualitative difference between an A and B standard turns on the meaning of the word "proficient". Consulting the dictionary we find that proficient is "expert, skilled, adept"; appropriate is "specially suitable, proper, fitting"; and accurate is "executed with care" or "in exact conformity with truth". So, according to the 'definition' of A and B standard, the B standard requires a student to apply procedures in a suitable way, with care and correctly; the A standard, on the other hand, requires a student to apply procedures in a suitable way, with care and correctly and expertly. These semantic niceties are too subtle to allow my small brain to reliably and efficiently mark students' work !

Standards in B2008 : Knowledge and Procedure
One might hope that B2008 addresses the shortcomings of its predecessor. It does not. It merely substitutes one set of vague and difficult to apply 'definitions' by another. We no longer need mysterious criteria of demarcation between "consistently", "generally", "sometimes", and "rarely" since now it is enough that, in every case, "the student's work has the following characteristics … ". In the case of EC1, these include

> "application of mathematical … procedures in routine and non-routine simple tasks, through to routine complex tasks, in life-related and abstract situations." (p34)

Analysis of B2008 KP standards
(1) Immediately we are faced with the task of introducing an arbitrary, but precise, rule to answer the question: 'how many instances of characteristic C must a student's work possess such that we can describe that work as having characteristic C' ?
(2) The conceptual simplification achieved by ditching the B2001 distinctions 'consistent-general-sometimes-rare' has been made at the cost of introducing a fresh set of imponderables. In fact, with respect to procedures, B2008 represents a doubling in complexity, since these four distinctions have been replaced by the eight new ones in Figure 1.

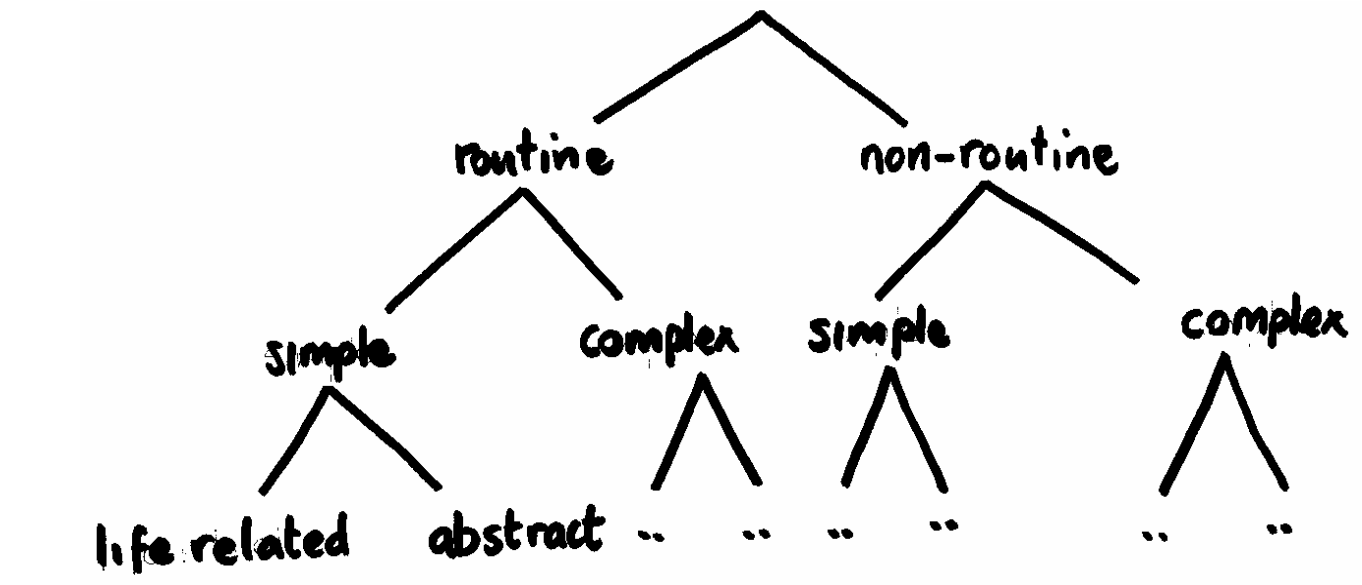

Figure 1

Further, these categories are inherently non-quantitative. The tree in Figure 1 opens the door to staffroom disagreements about whether a problem is non-routine, complex, life-related or routine, simple, abstract. Imaginable scenarios are worthy of Monty Python.

Concluding remark on B2001 and B2008 KP syllabus standards

The analysis above leads one into head-spinning complexities that have such a debilitating effect on the teacher as to lead to disengagement. Let the reader decide if it is an overstatement to say that these syllabuses mark a return to the scholasticism of the middles ages. A time when, we are told, even great thinkers like Thomas Aquinas occupied themselves with the number of angels that might fit on a pin. Thus are intelligent, hard working people now made to be occupied with similarly meaningless (in the sense of essentially unresolvable) debates about the difference between "sometimes" and "rarely", doing things "appropriately and accurately" vs "appropriately and accurately and expertly", and so on.

General concluding remarks

The introduction of B2008 nowhere mentions the reason why B2001 has been superceded. It just has. It is clear from the foregoing that my view is that B2008 represents no more than the replacement of one set of unnecessary difficulties by another. Having been at pains to micro-analyse (part of) the EC1 standard of B2001 and B2008, I now let my hair down and make some sweeping conclusions.

A fundamental change in assessment is needed where simplicity of syllabus assessment regulations is a fundamental design principle of syllabuses. Consequences would be

(*) what is taught in the classroom would be (in mathematics at least) essentially unchanged.
(*) conscientious teachers would not lose sleep at night worrying about how to mark students' work based on ill-defined assessment criteria.
(*) students would know where they stood with respect to their progress, instead of being confronted with highly complex profile sheets.
(*) teacher errors in marking work would be fewer (PF1).
(*) teacher errors in book-keeping results would be fewer (PF1).
(*) detection of teacher errors would be more likely.
(*) parents would be able to understand the mechanism by which their children are being assessed.
(*) the time consuming (and therefore expensive) need for workshops on "how to understand the syllabus" would be greatly diminished.
(*) marking and reporting would both be streamlined, making teachers happier people, and more able to give their time and energy to the students that they serve.

Nothing constructive has been said, and no apology is made. The only way that complexity can be mastered is by separating concerns. In this article the concern has been to criticise what exists, not to propose an alternative. In mathematics I know that dramatically simpler alternatives to B2001 and B2008 exist, but a change in the status quo is needed for them to be taken seriously. Perhaps a revolution is needed. A small one. Revolutions take place from the bottom up. If I have described your frustration, your 'bad' feeling because the 'system' prevents you from doing as good a job as you could, then what are you going to do about it ?

References

[1] Goldson, D., “Confusing QCAT”, in Queensland Teachers’ Journal, Vol 32 No 1, Feb 2009.
[2] Mathematics B Senior Syllabus 2001 (http://www.qsa.qld.edu.au/learning/1890.html)
[3] Senior Syllabus Mathematics B 2008 (http://www.qsa.qld.edu.au/learning/1892.html)

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Doug Goldson.
December 2009.

23/8/2010

Has the QSA lost its way?
or (Some concerns about senior syllabuses.)

In late 2009 I wrote an article called “Keep it a Simple Syllabus (KISS)” about the new (2008) senior Mathematics B syllabus. The article contained detailed criticism of the new syllabus, as well as criticism of the old (2001) syllabus, and was published in abridged form in the March 2010 issue of the Queensland Teachers’ Journal. The full version later appeared in the winter 2010 issue of the Journal of the Queensland Association of Mathematics Teachers. The article was also forwarded to the QSA in April 2010. The article has provoked several responses. The purpose of this short follow up is to communicate these responses to the Queensland teaching community, and to explicitly request wider feedback from it.

Whereas the original KISS article was concerned with a single maths syllabus, the criticisms within it are potentially applicable to any senior syllabus. These criticisms are that (1) syllabus assessment criteria are unnecessarily complex, and (2) the prohibition of use of marks to assess students’ work makes assessment judgements unnecessarily subjective. (Of course, it is not disputed that all assessment contains an ineradicable element of subjectivity.) So, if you are a senior teacher in any subject, please read what follows, and take the time to express your opinions on the state of your syllabus.

Returning to the KISS article, one kind of response is illustrated by this simple quotation: “The maths staff at X thank you”. This feedback is heartening. I often wonder if time spent criticising QSA policies is time well spent. This feedback tells me that it is.

The second kind of response is a more significant motivator for criticising QSA policies: “There are a group of us experienced teachers at Y who are concerned with the direction that maths/science have been going. After nearly forty years teaching senior science … I will not do it anymore. … The assessment tail is wagging the dog and *the uncertainty of making judgments about student performance* is now beyond me.” (my italics).

The QTU has warned that a crisis is looming in the maths and science staffing of state schools. A sensible response to this situation is to work to retain staff who are close to, or eligible for, retirement. Yet, here is a clear case of a teacher of prodigious experience who is giving up senior science because of QSA assessment policies. They write : “I am quitting teaching as soon as possible, despite still enjoying being in the classroom”. Faced with excessive workloads and ‘mind-boggling’ assessment requirements, common sense psychology says that many teachers will try to resolve this difficulty by avoiding the teaching of senior maths and science subjects. Those who can not, or will not, give it up, are left in frustration, knowing that it could all be done simpler and *therefore* better.

The third kind of response is most disturbing, because it casts doubt on the reliability of the QSA syllabus development process, elements of which appear arbitrary and driven by bureaucratic imperatives. For example, in KISS I wrote that the maths B(2001) exit criterion of “communication”

> … concerns a skill that is so intimately connected to [the others] that it staggers me that anyone should see fit to judge it separately from them. In plain English, when a student does not know very much mathematics and does not reason well in novel mathematical situations then they do not communicate well either ! This makes it redundant to assess this attribute separately from the other two. Further, since ‘good communication’ is an ineffable attribute it is very hard to judge it reliably.

I am not the first to think these thoughts. The view that this criterion is not independent of the other two was shared by the maths B(2008) syllabus drafting committee, which duly recommended a useful streamlining of the syllabus to just two criteria of assessment. The QSA response to this was ‘you must have three criteria’. This can be defended on neither logical nor educational grounds. It is a bureaucratic imperative.

It is one of the deep ironies of the maths syllabuses that teachers are no longer allowed to use arithmetic to judge the standard of their students’ work: numerical marks can not be used to mark work. This decision to ban the use of numerical marks was not recommended by the drafting committee. It was never foreseen by them. Indeed, at the time the syllabus was being written the committee was advised by the QSA that a school could mark work in any way that it saw fit, provided that this reflected syllabus standards. The banning of numbers came later, at syllabus implementation time.

Altogether, the feedback about syllabus development that the KISS article has elicited is that much of the B(2008) drafting committee’s work was dictated by predetermined QSA policy, and that the actual syllabus implementation in 2009 and 2010 has significantly deviated from that which was foreseen by the committee. A significant element of arbitrariness – that there should be exactly three exit criteria, that numerical marks can not be used – was imposed by ‘unqualified’ people (that is, non-maths teachers and non-teachers).

This brings me to the title of this article : has the QSA lost its way ? I am not qualified to say that it has. I confine myself to what I know, which is, (1) that B(2008) is deficient, (2) I am not alone in thinking this. A group of Queensland maths and science teachers who share the sorts of concerns outlined in this article are organising around Professor Peter Ridd at James Cook University. This group is campaigning for change by lobbying teachers, unions, ACARA, universities, and P and C associations. For more information on this group and their activities, contact Professor Ridd.

A matter of interest to me is the extent to which these concerns about senior assessment are shared by other maths and science teachers, and by teachers of other subjects. Specifically, concerning the assessment requirements of your subject, I would like to know

(1) Are they over complicated?
(2) Are they written in a simple and clear way, such that they can be unambiguously interpreted?
(3) Are they an unreasonable burden on your work at marking time?
(4) Are they understood by students? Do students understand what they need to do to get an A, B, C grade?
(5) Do they make it easy to explain your decisions when a student queries their grade?

Please take the time to answer these questions and to provide any other information that you think is germane. I have created an email address for this purpose : qsa000@gmail.com . Should I make any use of this information then its source will remain anonymous.

Doug Goldson, August 2010.

Senior Assessment, Teacher Workload and Student Standards

Doug Goldson.
qsa000@gmail.com

November 2010.

This report derives from an article called “Keep it a Simple Syllabus (KISS)” and was first published in the Queensland Teachers’ Journal (March 2010) and later republished in the Journal of the Queensland Association of Mathematics Teachers (QAMT) (winter issue). It is an analytic attempt to debunk the recently introduced Maths B (2008) syllabus. It resonated with some teachers sufficient for them to contact me and share their concerns about this syllabus. The result of this correspondence was the second article called “Has the QSA lost its way?”. This too was published in the QAMT Journal (September issue) and then sent to the mail list of the Science Teachers Association of Queensland (STAQ) (November). In this second article I explicitly requested teachers to contact me with their opinions about senior maths and science syllabuses. This report is the result. The questions posed to teachers were,

(1) Are syllabuses over complicated?
(2) Are syllabuses written in a simple and clear way?
(3) Are syllabuses an unreasonable burden on your work?
(4) Are syllabuses understood by students?
(5) Do syllabuses make it easy to explain your decisions when a student queries their grade?

Let me be clear about the purpose of the present report. My goal is to present some of the responses to these questions that I have received from some teachers. This survey does not pretend to be scientific. The number of teacher respondents is very small. Against this, the responses are rich. Teachers were invited to write what they think; not to click on boxes that can be summed so as to measure (sic) their satisfaction levels.

Teacher credentials.

(**R1**) Science HoD with 25 years’ experience.
(**R2**) Senior science teacher with 40 years experience.
(**R3**) Ex-deputy principal.
(**R4**) Teacher with 14 years experience.
(**R5**) HoD with 20 years experience.
(**R6**) HoC
(**R7**) Teacher with 35 years experience.
(**R8**) Science teacher.
(**R9**) Science and maths teacher.
(**R10**) Teacher with 25 years’ experience.

Are syllabuses over complicated?

(**R1**) The syllabi are easy enough to follow ... The assessment is the complicated part!

(**R3**) I find the assessment criteria a nightmare.

(**R7**) Yes, for no good reason.

(**R8**) The immediate past Science syllabus had one ‘Difficult’ criterion ... . Now in the new syllabuses – we have the ‘difficult’ criterion in every one of the nine assessment categories ... . It is up to us teachers to provide those opportunities and then up to the students to demonstrate they are good enough in not one – but nine categories. This has to exponentially complicate each assessment piece from where we were only a few years ago.

Are syllabuses written in a simple and clear way?

(**R1**) The exit statements ... are a mystery to me. E.g. In one criterion, for an A, students need to “critically analyse” and for a B “analyse”. This relies on “gut feeling” as I was told ... . Not sure that “gut feeling” goes over well when justifying anything to students and parents. The criteria are ridiculous and I am yet to get a straight answer from anyone I ask.

(**R3**) The criteria for judging standards are too complex.

(**R7**) No.

Are syllabuses an unreasonable burden on your work?

(**R1**) Ridiculously so, but probably even more in the assessment setting phase. We agonise over meaningless wording of criteria sheets. ... Assessment takes hours and hours and hours. This would be fine if there was an educational benefit but all I can see is lower standards and more confusion.

(**R2**) As for the assessment program, the excessive workload on teachers has become enormous. ... We have to develop such detailed criteria to judge every piece of assessment and then try to apply them so subjectively.

(**R4**) The formal assessment process has become so onerous that I am doing almost no informal marking of student work.

(**R4**) The workload in marking has increased dramatically. Also, the effort involved in creating a balanced supervised assessment that adequately addresses the standards across all levels and across the breadth of key ideas is ridiculous.

(**R6**) Marking time has at least doubled for a set of senior papers.

(**R7**) Yes, and they take away time and energy from constructive work.

(**R8**) Not only marking time - but in setting assessments as well. ... we were derided in R6 comments from a rude panel chair that our items were 'not acceptable as they were modified questions from the previous syllabus'; no assistance from QSA, or resources to help start the process off. ... I have been completely flattened by the stress this currently unsupported syllabus has caused.

(**R9**) When marking an EEI in physics, it takes all of my free time for a week.

(**R10**) I have been collating Year12 Maths B and Physics results and what should take one hour now takes two days of examining profiles, comparing criteria (that are totally flawed in the first place), filling out R7s, etc.

(**R10**) My colleagues and I have the following experience in science and maths :- 25, 25, 20, 20, 25 years experience. We are appalled at the direction QSA is going with maths and science. I spend all my time writing work programs, creating task specific criteria sheets, recording student grades in 3 criteria and 9 sub-criteria for each assessment item, deciding between 'complex' and 'challenging' and 'complex' or 'challenging'.

(**R10**) We spend all our time addressing all that QSA requires us to do - mainly dealing with the criteria/standards based assessment. I spend so little of my time actually developing exciting lessons. All the QSA PD is about the assessment and not about resources. The QSA SEO should be collating resources and distributing them to the teachers. There is no actual curriculum support at all.

Are syllabuses understood by students and parents?

(**R1**) No, and I can't explain to students and parents how to improve.

(**R3**) Do teachers understand them? I am sure the students don't.

(**R7**) No. In fact the hardest question a student can ask in Year 12 Mathematics B is, "How am I going?" .

(**R8**) I have had to compile a "Syllabus Words Explained" list and spend class time going through the meanings of the words in the exit standards. I have been over it many times and it is only at the end of year 12 there is some sign the students are understanding little bits of it.

(**R9**) Students don't have a clue as to why a standard was awarded. They don't know what questions to ask. If they do ask, they do not understand the answer and so quickly learn not to ask.

(**R9**) The students wouldn't have a clue what the criteria sheets mean. They attempt to do what I tell them to do to get an A etc. How well they do this is how well they understood me - not the criteria sheets. Once I have awarded a standard there is no comment whatsoever. In the past, I used to have my top students competing vigorously for 1/2 a mark and they were well justified in doing so.

(**R10**) The whole system of criteria is ludicrous - most parents and students haven't a clue what they really mean.

Do syllabuses make it easy to explain your decisions?

(**R1**) The language makes it hard. How can you honestly explain to a student that they should have “revealed meaningful interrelationships” but that they only “described interrelationships”. It makes the teachers look like idiots.

Effect on teacher morale and staff retention.

(**R1**) I am so frustrated with the science syllabi that I have considered leaving teaching (but can’t afford to retire yet).

(**R2**) I cannot in all conscience face my senior students and impose such ... onerous workloads upon them.

(**R4**) I find the process [of assessment writing] so daunting that I can barely face it. I end up becoming extremely stressed with worry that the instrument does more harm than good because, in attempting to address the standards, it becomes too difficult.

(**R5**) I will not be teaching a senior science in 2011. I have had enough of struggling to write assessment items and make judgments on criteria that I do not believe are appropriate nor well written for the sciences.

(**R6**) Our staff hate it [criteria based assessment] and do want to avoid senior classes. Some elderly teachers are thinking about premature retirement due to it.

(**R6**) Teachers have lost confidence in their ability to assess due to its subjective nature.

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(**R10**) In maths and science, the experienced teachers want to leave and would, if they could find alternative employment, and the new teachers can hardly cope with the ridiculous paperwork that the assessment process requires. Anyone with a logical brain ... would be frustrated by the system and lack of support from QSA in terms of actual teaching resources.

Effect on school science as a discipline.

(**R1**) My first love is biology and it makes me very sad to see what is happening to the subject.

(**R2**) The awarding of grades has become so arbitrary and difficult to justify and the course does not give students a solid grounding in the subject.

(**R8**) This is reflected in a worrying trend – science numbers are decreasing as the word is definitely out there that science subjects are too hard and require too much time on these big assessments.

(**R10**) Physics is going to end up being totally assessed by "Write an essay on Einstein." type of assessment items.

(**R10**) We have our best maths students writing inane paragraphs at the end of maths problems making sure they address CJ, strengths and limitations, assumptions, reasonableness, etc .

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Effect on student performance.

(**R1**) I can’t explain to students and parents how to improve. It is incredibly difficult to get a VHA in biology and, for talented students, it shouldn’t be.

(**R2**) I feel now that we are perpetrating a fraud on the students. They are learning so little and are becoming so stressed in the process.

(**R5**) I am not happy leaving chemistry teaching. However until the syllabus assessment and criteria take up some simple principles it pains me too much to see students making efforts which are not rewarded.

(**R8**) For students to demonstrate all the different things they are expected to show, they must be very, very good, and must spend excessive amounts of time on their assessments. I wonder how many university courses have first year students conducting an independent experimental investigation?

Effect on quality control.

(**R1**) I feel as though I am “flying blind” as a panelist and everyone at the meetings disagrees with the interpretations, which ... seem to change from year to year.

(**R4**) I am coming to a fairly good understanding of what I think the syllabus exit standards statements are asking. After verification reviews, it is clear that many of the teachers are not in the same boat - they may be in another ocean.

(**R4**) I made the complaint to the panel chair and QSA that the process is a farce. The complex nature of the modern assessment process makes it impossible to adequately review a package in the QSA-allotted 2hrs. The same goes for monitoring and verification.

(**R5**) All the science panels are seeking panelists. It seems that no one wants the job of administering these unworkable syllabi.

(**R5**) There is too much variance across the state as to standards of EEIs.

(**R5**) I do not have faith in the moderation process and I guess neither do panel chairs or panelists.

(**R6**) Teachers are worried about the assessment and not the quality of their teaching.

(**R8**) Why is it that we cannot use numbers to make decisions but QSA must use numbers in determining OP level? ... QSA will say ‘we never told you not to use numbers' but I heard that clearly from several QSA officers at syllabus workshops – they then say ‘schools must show how the numbers match the standards’, but numbers cannot be used to do that, certainly not these verbose versions we must work with - and they know it.

(**R9**) Because this method of assessment is so complicated the individual can successfully argue almost any outcome and get away with it as no one else understands [the syllabus] either. In the past, panelists were reasonably consistent as they only needed to look to the quality of the assessment and marking and make sure the numbers added up. Now it is like going before a judge - you had better hope that the one you get is sympathetic to your cause.

(**R10**) .The district moderation panels are a joke in that they do not objectively compare the standards across the district. ... I would think that students at some schools exit Yr 12 with very poor knowledge and skills in maths and physics.

Final thoughts.

Dangerous thinking gets the last word,

(**R6**) It is time teachers ... were given a say in the process of change and if not consulted properly then it shouldn't be done. Who is in charge here? Who is writing the assessment criteria?

(**R7**) The QSA system survives because of the compliance of teachers. If we cease to be compliant it will change.

Doug Goldson, November 2010.