To: The Education and Innovation Committee eic@parliament.qld.gov.au

From: Peter Finch 20 Solander Court Karana Downs 4306

This is a personal submission and does not represent the views of any association or organization with which I am involved.

Personal details about submitter

I have been teaching for 35 years and have taught in New South Wales, Queensland, the United Kingdom and Brunei. In Brunei I was an advisor on curriculum to the Department of Education and Chairman of the International School at Berakas. Currently I am the Physics coordinator at St Joseph's College, Gregory Terrace.

Dear Committee Members,

My submission will be in two parts.

In Part A I will discuss an item of assessment which was tabled at the EIC on 20 March this year.

In Part B I will give my experience of the QSA's assessment model.

Summary of Part A of submission

An item of assessment (an EEI) was tabled at the EIC on 20 March 2013. It was tabled on behalf of the QSA and was explained by a Physics teacher.

Many of the presenter's statements on that day would be hotly contested by the majority of his peers. Rather than demonstrating the benefits of the EEI, this presentation, on closer scrutiny, showcased the problems with it.

[redacted] The presenter claims that, by following the QSA model of marking, he achieves precision and accuracy. If this were true, why then do none of his peers agree with his grade?

Summary of Part B of submission

(i) Ensuring assessment procedures are supported by teachers

An independent study has shown that roughly 40 % of Queensland Maths and Science teachers have strong reservations about the QSA's system of assessment.

(ii) The ability of assessment procedures to support valid and reliable judgements of student outcomes

There are many problems with the QSA model of assessment. These include a huge increase in work load for teachers and students, the QSA's lack of support, its inconsistent and even contradictory advice on syllabus requirements and assessment, the QSA's refusal to allow any use of marks (in spite of their official advice to the contrary), serious equity issues, lack of laboratory facilities and an absence of exemplars. From my experience the EEI and ERT are so time consuming that teachers do not have enough time to cover the basics of the subject. These assessment types can be of limited educational value and authorship is impossible to verify. Marking of assessment is cumbersome, subjective and the process is opaque. This is also true of the process of assigning a final grade to the student at the end of the course.

My detailed submission: Part A

I have had a close look at the Task Sheet and EEI that the QSA tabled in the Parliamentary Enquiry at 11:52 am on 20 / 3 / 2013.

http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/tp-20Mar2013-Task.pdf
http://www.parliament.qld.gov.au/documents/committees/EIC/2013/QldAssessment/tp-20Mar2013-Assignment.pdf

[redacted] Anyone outside the teaching profession might wonder why the QSA would permit such a substandard presentation of an assessment item at something as important as a Parliamentary Enquiry. For Maths and Science teachers however this example is fairly typical of the type of advice that teachers have been receiving from the QSA over the course of the current assessment system. The QSA does not always follow its own guidelines and the advice coming from various different panel experts is frequently contradictory and inconsistent. This has led a large number of teachers to a position where they have no faith in the QSA, its system of assessment or its level of professional leadership or competence.

The Education and Innovation Committee listened to a presentation by a Physics teacher. I do not doubt that the presenter has been teaching Physics for some time and is passionate about what he does. What the EIC may not be aware of is the fact that there are many teachers in Queensland with just as much or even more experience and who are just as passionate, and yet they disagree with almost everything that was placed before the EIC.

The Task Sheet for the EEI gives the word limit as "Introduction and Discussion no more than 1000 words." An experienced teacher should be aware that the 1000 word limit is for Discussion, Evaluation, Recommendations and Conclusion. The Introduction is *not* to be included in the word limit, according to the QSA's own guidelines.

The presenter should be aware that many Mathematics and Science teachers would strongly disagree with his statement on grading an EEI: (Hansard P13) "A key thing

here is it does come down to my judgement. …..I do not let a set of numbers do it for me. I remember in a previous syllabus I had a lot of conversations with teachers because the cut-offs for an A in one of the criteria was 80 per cent. I remember having conversations with the teacher about, 'This student's got 79.5 per cent. Should we round that up to 80 and give them an A?' and them saying, 'But they haven't actually got to the 80 per cent.' They are arguing about a half of one per cent. The answer is obviously it is not about the percentage; it is to look at the work and ask, 'Does it look like an A? Can I find things in this work that match the A standard?'"

The presenter and every other Senior Maths / Science teacher in Queensland knows that teachers who are new to teaching do not have this knowledge. Many such new teachers are the sole Maths or Science teacher at a country school. Even experienced teachers cannot always agree on grades for assignments. I have the results of the grading of this same EEI by five current Queensland Physics teachers. Four of these teachers were given no knowledge of the source of the EEI (I knew its source before I marked a blank copy). A blank copy of the EEI was given to each of the other four teachers to mark independently. Two of these teachers are current or former Physics Coordinators and Physics Panel members. The teachers come from two different schools.

[redacted]

[redacted]. To quote the presenter "A key thing here is it does come down to my judgement…" However, though he points out how silly it is to use marks: "They are arguing about a half of one per cent", the presenter's own peers graded parts of this same assessment item from a low of C to a high of A-. The presenter's lowest grade was an A. Now a C equates to *around 30% less than the presenter's grade* under the old system. This is substantially higher than the half of one per cent he claims to be incredulous about. In fact the presenter alludes to this variation himself (Hansard P13) when talking about sending his work to the Physics Panel to be checked by his peers "…hopefully they will agree with the decisions that I have made." If the grading was as accurate as he suggests, he would be in no doubt that his peers at the Physics Panel would come up with exactly the same grade as he did. At other times the presenter suggests that his grading of assessment items is done with almost mystical precision "So I can say with absolute confidence that this student has demonstrated an A standard." (Hansard P14).

The exercise above shows that judgements under this system are subjective and can lead to a large range of outcomes. The QSA's marking specifications are subject to a wide variety of interpretations. Even very experienced teachers do not have the ability to grade assessment items with uniformity even though many passionately believe that they can. The example above demonstrates this.

One school I am familiar with allows cross marking (where teachers check the accuracy of their peers' marking) variation of a third of a band. Bands are A, B, C etc. That is, two different Science teachers, on the same assessment item from the same student are able to vary by a third of a band before any further marking is deemed necessary. This is roughly a 7% variation under the old system. This is within a single school with the *same* assessment from the same student. What variation would we expect across different schools, different assessments and different students? From my experience at the Physics Panel, a variation of 10 - 15% would be common.

The presenter states (Hansard P 14) "If you have a look in this document you will find also a section that is highlighted in green. That is one example of the evidence of how this student matches that standard. I will not go into what the coefficient of restitution of a ball is and why that is complex, but I hope you will take it from me that it is complex." This statement gives an example of QSA's marking specifications being subject to a wide variety of interpretations. I for one do not believe that the concept of coefficient of restitution is as complex as the presenter suggests.

I went over the concept of coefficient of restitution with my Year 8 Science class last week in a ten minute period at the end of the class. Bouncing a ping pong ball, I explained the concept of how the ball travels faster before it hits the floor than after. The difference in speed is due to energy losses in the collision with the floor. I then wrote the formula on the board. I gave my students some of the data from Table 1 of the EEI. There were only 12 students who had brought their calculators to class. (We are studying Matter and are not using calculators at present). I worked through 4 examples of calculating the coefficient of restitution, e, with these students. I then gave them the data for Trial 2 of the bottom line of Table 1 and asked them to calculate e, the coefficient of restitution. Ten out of the twelve students with calculators got the correct answer. [redacted]

The presenter explains to the EIC how he prevents cheating on P 12 of Hansard: "This is particularly important because this is when I get to give students advice which just goes to that student and not to the tutor or to mum and dad at home. I know that I have said to the student, 'You need to work on such and such.' When I get the final result, I am going to look to see that they have done what I have asked them to because that is a key thing that *I know that mum or dad or the tutor has not been able to do because I have spoken to them individually about it*. (my emphasis). It is also a chance for me to say, 'You have written this. Just explain that to me. What were you trying to say?' Again, I can gauge and check in all the way along to authenticate the work." Most of the presenter's peers would suggest that he is severely underestimating his students, their parents, their tutors and their collective capacity for innovation. The tutor can, for example, bring part of a write up to the student and tell the student to put it into their own words. The tutor can then ask questions about the work until everyone is satisfied that the student can pass an oral test on the EEI.

The presenter seems to have a simple answer to the claim that students' EEI's are too long and take up too much time. Talking about the EEI that he submitted he says "It is six-pages long, and I know there has been some discussion around the length of EEIs and being 40 and 50 pages. The other thing is this is an A standard, so an A standard

EEI can be produced in six pages. It does not have to be a massive document. If it was a year 12 level, it would need to be a little bit longer. It would be allowed to be a little bit longer—about 500 words longer, and that is about half a page of this sized writing. So a year 12 one would be a little bit longer than this."

Firstly, I have established above that many of the presenter's peers would argue that the assignment should have been graded as a B. Secondly, the presenter obviously did not visit the QSA's website for advice last year. The QSA' s "Sample student response: Standard A" was 21 pages long and ran to a total of over 5300 words. The Analysis, Discussion, Interpretation of Data and Conclusion were 1950 words long (450 words more than the maximum allowable). It could have been worse. Some (but as usual, not all) Physics Panels have been demanding an Annotated Bibliography, with approximately 50 words to be written on each source used in the writing of the assignment. If an annotated bibliography had been submitted along with the QSA's "Standard A" assignment, an extra two pages would need to be included to describe the 20 sources used. That is almost four times the length of the presenter's example!

I will now discuss the student's EEI. I am aware that this is the work of a real student who is proud of her assignment. The EEI shows some good work and this student has the potential to do well in Physics.

This demonstrates one of the major problems with the EEI as a form of assessment. Did the student design the experiment or was the design phase a 90 minute internet search? Remember that this is group work and 4 students can find an extraordinary amount of literature in a short time on the internet. If a well meaning teacher indicates what they should type into their search engine and their tutor does the search for them the job becomes a simple task of cut and paste. A relative who is a Physics teacher can guide them on potential problems with the practical part of the project and can proof read several drafts until the student has a perfect write up. You will note that, with this scenario, the student has done the actual measurements in the practical and has done the write up. For this student the practical has been reduced to the "recipe prac" (Hansard P 11) the presenter is so disdainful of. It would be impossible for the supervising teacher to ascertain that all of the background work was done by someone else. Some teachers would not even have the time to try and find out. Compare this with a student in a composite Year 11 / 12 Physics class in a country town. The teacher, though dedicated is stressed and very busy. This teacher is new to teaching and does not know how much help to give the student and as a result gives almost no help. The teacher will not have seen a range of responses to the EEI to enable them to objectively grade the assignment with the QSA's subjective and imprecise criteria sheet. The student's relatives do not work in science. There is no spare money for a tutor. The presenter may not have seen such a scenario but many of his colleagues have. I have assisted several teachers who find themselves in similar circumstances.

When you consider the range of possibilities above, you come to the conclusion that many of my colleagues have. We feel that this form of assessment is inequitable, unfair, promotes cheating and is of limited educational value in many cases.

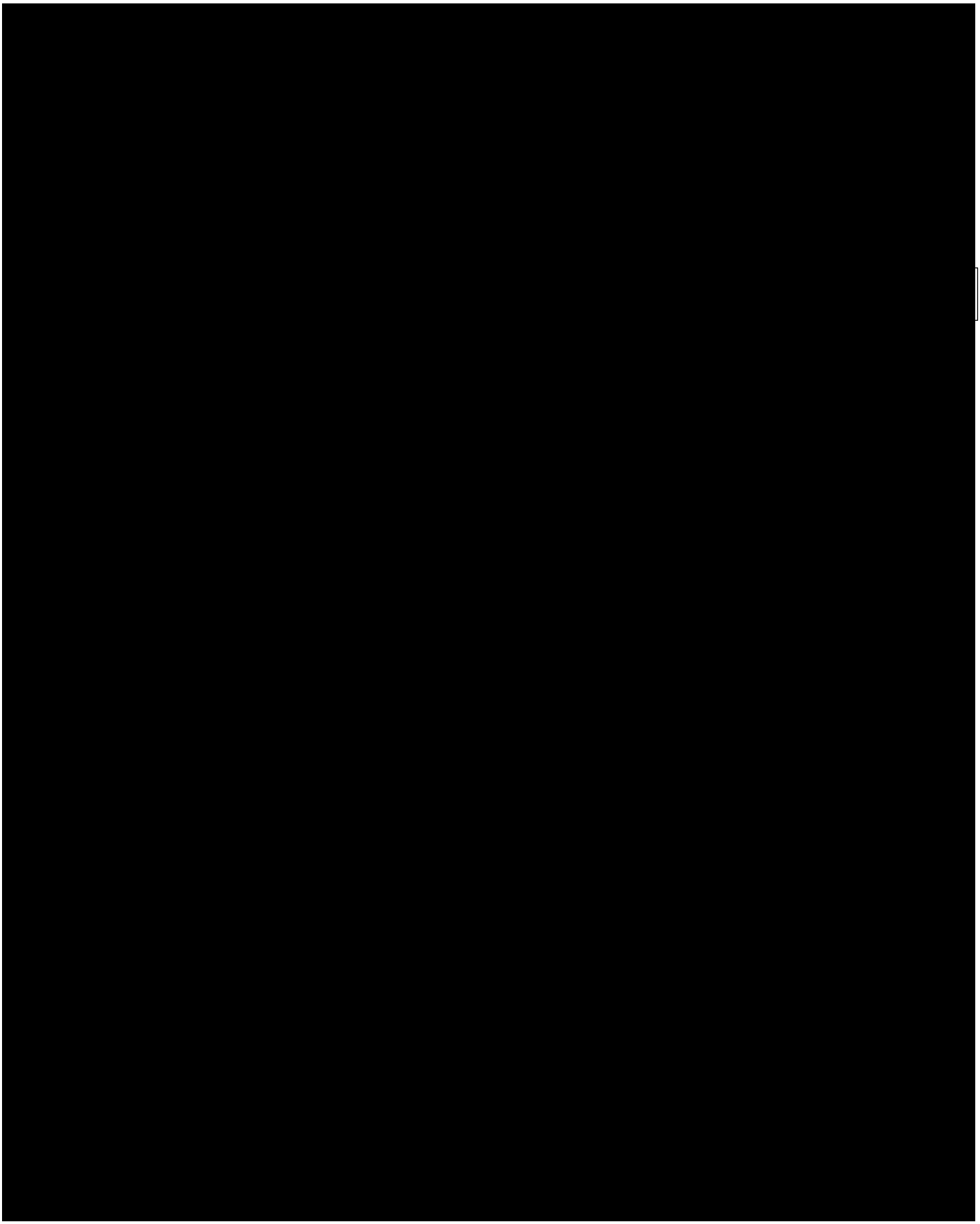
[redacted]

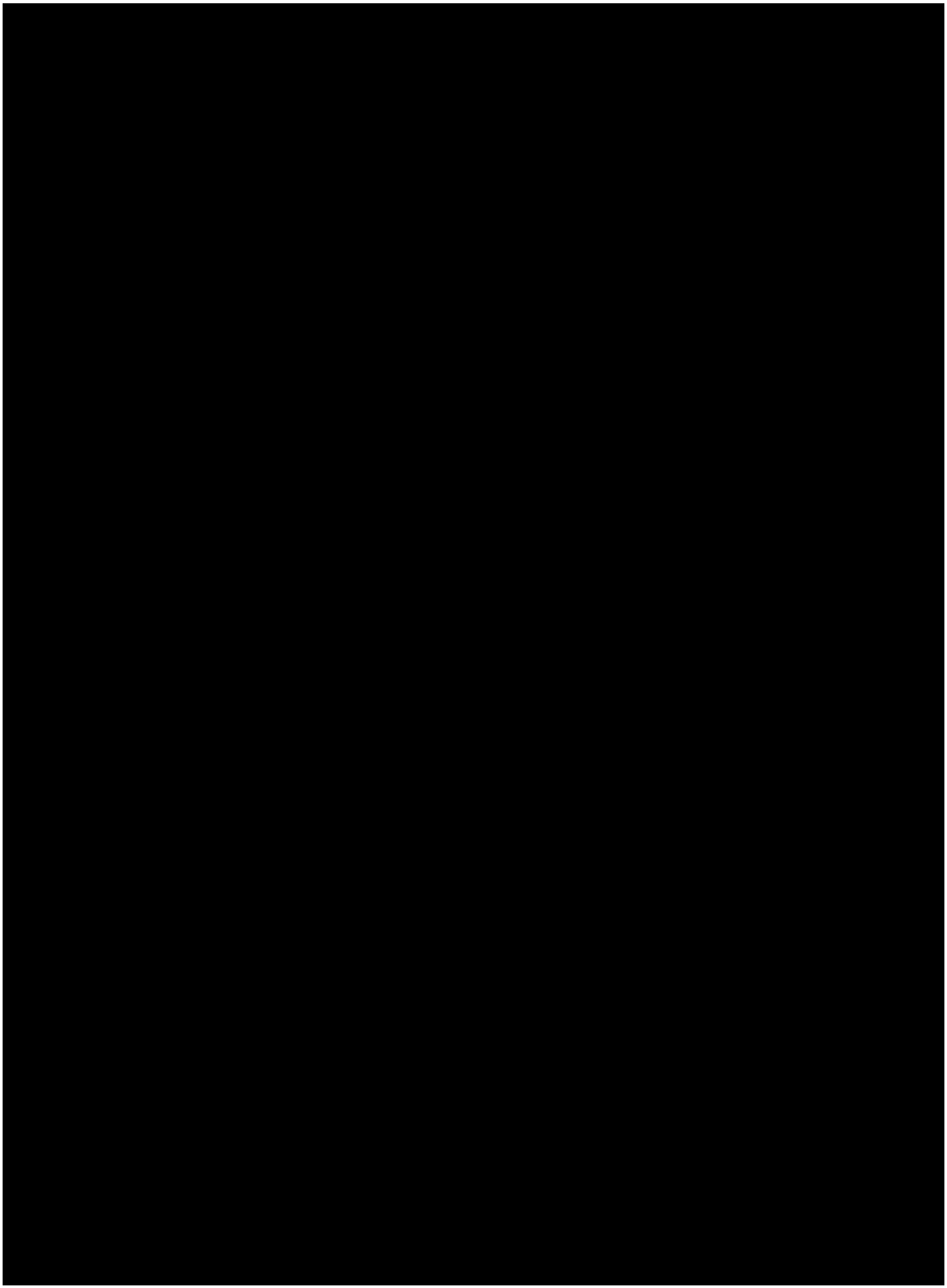
The Criteria Sheet for Knowledge and Conceptual Understanding claims that "Complex and challenging concepts and theories have been reproduced and interpreted" and the EEI has been awarded an A. [redacted]

Again, these grades when compared with the presenter's grade of A show how subjective the system is.

[redacted]

[redacted]





[redacted]

Rather than showcasing the QSA's methods of judgement as superior to conventional marking, this EEI raises serious questions about the QSA's whole approach to assessment.

My detailed submission: Part B

(i) Ensuring assessment procedures are supported by teachers

An independent study of teacher attitudes towards the QSA's assessment scheme was undertaken in 2012 by the Queensland Independent Education Union. The results to the statement "Current external moderation processes ….. are working well in the subjects I teach" from Maths and Science teachers was:

106 strongly agreed while 129 strongly disagreed with the statement. 73 respondents were neutral.

The next statement was "I am confident that this process delivers accurate grades for my students." For Maths and Science teachers:

140 strongly agreed while 111 strongly disagreed with the statement. 60 respondents were neutral.

These figures show that around 40% of respondents to this survey have strong reservations about the QSA's system of assessment.

(ii) The ability of assessment procedures to support valid and reliable judgements of student outcomes

From my experience, the system advocated by the QSA simply does not work. If it was a better system than the other available systems, I would be its most ardent supporter.

I am aware that, in evidence before this enquiry, the QSA has stated that marks can be used. However, any teacher foolish enough to actually use marks will be admonished and their students' work will receive extra unwarranted attention at panel meetings. In Appendix B I tender a Form R3 from the QSA Physics panel. At the end of paragraph 1 is the statement "**The process of using marks to determine the level of achievement instead of exit criteria has discriminated against the lower achieving students**.(my emphasis) Folio E, in particular items 4 and 5, demonstrated evidence of a C standard and yet was awarded D and E grades in KCU." It should be noted that student E did very poorly on the A standard (difficult) questions in KCU, receiving just 1.5 / 8 in item 4 and 0 / 8 in item 5. This gives a total of 1.5 / 16, which would result in a grade of E. In the easier C standard questions this student received a total of 3 / 16 marks for items 4 and 5. This corresponds to an E also. **Even people who are not involved in Year 11 and 12 Physics could see that it is preposterous to even**

talk about awarding a C grade to a student who receives a total of 4.5 marks / 32. The profile and mark sheets for Student E are in Appendix B.

So why did my submission receive the comment that I have …"discriminated against the lower achieving students…"? We teachers know the bullying tactics of the QSA well. The comment is there to put me in my place. My students do not deserve the extra attention their work receives because their teacher dares to use marks. As preposterous as the accusations against the student's work are, I have returned to the system of using grades because I do not want to have my students discriminated against.

To show how the system works, I have included the actual profile of one of my students, Student X, in Appendix C. The profile shows where he sits at the end of Year 11. If you look at this profile, you will see how difficult it is to assign an overall grade (for the total of the Year 11 results) using letters. The QSA tells teachers to get out all of the student's work, look at it, and then assign a grade. I had 80 students in that group. It is a bewildering task to follow this system for such a large number of students. Simply trying to choose the best student out of a sample of only 2 students is difficult enough because the two students will get different letter grades on each of the six assessment items. With a group of 80 it is impossible. Some schools give each grade a number: E- is 1. E0 is 2, E+ is 3, up to 15 for A+. Using this method for student X you get an average of 11.67 for both Knowledge and Conceptual Understanding and Investigative Processes and 10.17 for Evaluating and Communicating. You could argue that the student is most often 11.67 and on this scale give him a B (B corresponds to 11 with this system while 12 corresponds to a B+). You may wish to give him a B+ since he is closer to 12 that he is to 11. You may be tempted to average 11.67, 11.67 and 10.17 and come up with 11.17 which is a B. However, averaging is forbidden by the QSA. You may even argue that the student is an A or even an A+ because the student "demonstrates ability" at this level. Or you could even take a bit of a guess. Different teachers come up with different grades using this system. The same teacher can even come up with different grades using the same results profile because the system is so imprecise.

Numbers are very accurate whereas letter grades, by necessity, include a range of responses. For example, my computer program used to give (before I changed back to the QSA sanctioned system of letters and no marks) a C+ to anyone who got 5 / 8 or above on the C standard questions. Therefore two students can get a C+ with different marks. 8 / 8 on the C standard questions is a C+ as is 5 / 8. However, when you start adding letter grades, you are not aware of this range.

Look closely at the Knowledge and Conceptual Understanding on the profile of Student X to see the difficulty of using the QSA's system. Some people would say that the average of these letters results in a B. Others would say that, since the student received two A+ results, he should be in the A range. If you convert the letter grades to numbers and average the numbers you get 11.67 which corresponds to a B or B+. In fact, this student's grade was actually A- and this was obtained by looking at his marks. He received the high end of the range of marks in almost all assessment items. This meant that the computer program gave him a grade of A- and the student could see this by looking at his marks. This is transparent, accurate and objective. Marks are exact. Even if I have 8 students on A-, I can tell each of them their exact position with

respect to each other and they can see it for themselves. The top student has the top mark while the bottom student has the bottom mark. This is impossible with letter grades.

Many schools use a system of ‘sleight of hand’ to survive the QSA’s rules:
Firstly the exams are corrected and a mark is given. Now this mark is converted to a letter grade and this letter grade is written on the students answer in the assessment piece. As far as the QSA is concerned, these letter grades are added up and an overall grade is entered in the student’s profile. The sheet with the actual marks is kept hidden from the QSA.

This system works fairly well and keeps everyone happy. The students can add up their marks and see exactly how their letter grade was calculated and can easily see what needs to be done to improve their letter grade. The QSA is happy because their letter grade system has ostensibly been followed. The teacher is happy because by following marks and cut offs the system is transparent, accurate and objective.

There is another problem with letter grades. Different schools will use different criteria for the same grade. For evidence of this, I refer you to the quote above from a Physics panellist “The process of using marks to determine the level of achievement instead of exit criteria has discriminated against the lower achieving students. Folio E, in particular items 4 and 5, demonstrated evidence of a C standard and yet was awarded D and E grades in KCU.” This panellist obviously believes that Student E should have been awarded a C grade or some grade close to a C. I awarded him an E. We both believe we are right.

A possible solution to all of this

I believe that when the Australian Curriculum is adopted in Queensland we should go to a system of 50% external exam and 50% internal. We could share the cost of the external exam with New South Wales and Victorian. Both of these states would also be following the Australian Curriculum.

Appendix A

Appendix B

Form R3 — Year 11

School proposal for interim levels of achievement

QSA address: PO Box 307, Spring Hill QLD 4004; or deliver to Level 7, 154 Melbourne Street, South Brisbane

School:			
Subject: Physics	Subject code:	0 4 1	
District: Brisbane Central	Panel code:	A 4 5	

Number of students completing subject at Year 11: 84

Complete the table below, for each of the five sample student folios.

Interim level of achievement of student samples	VHA	HA	SA	LA	VLA
Sample folios submitted (e.g. A, B, C, D, E)	A, B	C	D	E	

School comments:

There are no students who are VLA. To make up 5 folios, 2 VHA folios are being submitted. Top student (A) and mid VHA (B)

Principal's signature: ..... Date: 5/12/12

Review panel advice:

Review panel advice:

The evidence in sample folios A-C indicates that standards were appropriately awarded for this stage of the course. However, folios D and E have demonstrated evidence at a higher level of achievement than indicated. The process of using marks to determine the level of achievement instead of exit criteria has discriminated against the lower achieving students. Folio E, particularly in items 4 and 5 demonstrated evidence of a C standard and yet was awarded D and E grades in KCU.

Chair's signature: ..... Date: 19/12/2013

for ☐ state, or ☒ district review panel.

Copies:
- Before meeting: Original, duplicate and triplicate forwarded with samples to be reviewed. Quadruplicate retained by school when making initial submission.
- After meeting: Original returned to school. Duplicate retained by Chair and returned to District Coordinator. Triplicate retained by Chair.

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PHYSICS STUDENT PROFILE

STUDENT NAME: Student E **EXIT YEAR** 2013

SEMESTER	ASSESSMENT TASK	KNOWLEDGE & CONCEPTUAL UNDERSTANDING															INVESTIGATIVE PROCESS															EVALUATING & CONCLUDING														
		A			B			C			D			E			A			B			C			D			E			A			B			C			D			E		
		+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-	+	0	-
1	1. SA exam (monitoring)												X														X										X								
	2. SA exam (monitoring)							X																		X											X								
2	3. EEI (monitoring)							X														X												X											
	4. SA exam (monitoring)											X														X													X						
	5. SA exam (monitoring)														X											X													X						
	MONITORING	**D**															**D**														**D+**														**D**
3	6. SA Exam																																												
	7. SA exam																																												
4	8. EEI																																											
	9. SA exam																																											
	VERIFICATION																																											
	10. SA Exam																																											
	EXIT																																											

Year 11, Physics

Item 4 **Mid Semester II, 20 September 2012**

Name: STUDENT E Teacher:

KCU 1; 2; 3	A KCU 1, 2, 3
C Q1 2 /2 Q2 0 /1 Q3 1.5 /5 TOTAL 2.5 /8	A Q9 1 /5 Q10 1 /3 TOTAL 1½ /8
IP 3	**A IP 3**
C Q4 5½ /5.5 Q5 2½ /2.5 TOTAL 3 /8	A Q11 2 /4 Q12 0 /4 TOTAL 2 /8
EC 1, 2	**A EC 1,2**
C Q6 1¼ /3 Q7 0 /2 Q8 0 /3 TOTAL 1¼ /8	A Q13 1 /4 Q14 1 /4 TOTAL 2 /8

Item 5

Year 11, Physics
End Semester II, 21 November 2012

Name: STUDENT E Teacher: [illegible]

$$\lambda_{film} = \frac{\lambda_{air}}{n_{film}}$$

C KCU	A KCU
C Q1 1/4 /2 Q2 1/4 /3 Q3 0/1 Q4 0/2 TOTAL 2/8	A Q9 0/4 Q10 0/4 TOTAL 0/8
C IP	**A IP**
C Q5 1/4 Q6 0/4 TOTAL 1/8	A Q11 2/4 Q12 0/4 TOTAL 2/8
C EC	**A EC**
C Q7 0/4 Q10 2 1/4 TOTAL 2 1/8	A Q13 0/4 Q14 1/4 TOTAL 1/8

PHYSICS STUDENT PROFILE

STUDENT NAME: Student X

EXIT YEAR: 2012

Semester	F/S	ASSESSMENT TASK	KNOWLEDGE & CONCEPTUAL UNDERSTANDING	INVESTIGATIVE PROCESSES	EVALUATING & CONCLUDING	
SEM 1	F	1. ERT	C+	C+	C+	
SEM 1	F	2. SA exam	A+	A-	B0	
SEM 1	F	3. MiniEEI	C+	B0	B0	
SEM 2	F	4. EEI	A0	A+	A0	
SEM 2	F	5. SA exam	A+	B0	C0	
SEM 2	F	6. SA exam	C0	A-	C0	
		MONITORING	A-	A-	B	A-
SEM 3	S	7. ERT Assignment				
SEM 3	S	8. SA Exam				
SEM 3	S	9. SA exam				
SEM 4	S	10. SA EEI				
		VERIFICATION				
SEM 4	S	11. SA Exam				
		EXIT				

11.67 11.67 10.17 $\bar{x} = 11.17 \Rightarrow B$