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Submission to:

The Parliamentary Inquiry into assessment methods used in Senior Mathematics, Chemistry and Physics in Queensland.

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I have been a teacher of Mathematics and Science since 1976 in State Schools. The last 25 years I taught and lead Maths at Kawana with one year off teaching in England at a Comprehensive School. In that time I have seen 5 revisions of the senior Maths Syllabus and was part of the trial when Maths A, B and C were first introduced. I offer the following comments related to the inquiry.

Ensuring assessment processes are supported by teachers

With the introduction of any new subject or syllabus revision, staff were involved in the process and in many cases were the key drivers of its implementation. The basic assessment types have not changed for the past 20 years within our school (along with many other schools across Queensland) offering students two tests and one assignment (either Extended Modelling and Problem Solving or Investigation) per semester. Staff review each item and share the load when in multiple classes. The following points have been noted by staff : -

- No one assessment item is more important than another
- Assignments allow for the higher order attributes to be addressed
- Assignments allow students to be monitored in their progress through the content.
- Real life contexts can be addressed and local issues addressed in the Mathematical content – students often find this a motivating aspect.

When we began the process of introducing new subjects at the very beginning, I gave the choice to the staff as to whether they would be involved in the trial. They agreed with a vast majority and were enthusiastic. Many of those staff have moved on or retired but there are still some of the original staff here and are still enthusiastic about the development of the subject and what it has to offer. These same staff give of their time to assist other schools with their experience and have provided advice, assessment ideas and teaching ideas.

I can recall staff being asked of past students to assist them in the solving of mathematical problems in the professions they have faced. Some of these involved some quite interesting and complex concepts. Staff also volunteer to tutor students (for free) in after school sessions that have students presenting concerns, problems and tasks that they have not been able to grasp in the classroom setting. The time that

students stay at the session is their choice and on occasion I have asked them to go home because the school was closing and being locked up.

Student Participation Levels

The numbers at our school have been dropping (until recently) due to the demographics of our area. However we have been an International school for many years and the students coming from overseas have readily joined the Maths B and C classes. Their performance has been of the highest standard in many cases. This has had a flow on effect to our Australian students as well. In the majority of cases the students doing either Maths B and C or just Maths B have been our highest achievers. Two years ago our OP 1 student did both Maths B and C, received a scholarship from her preferred university and has been tutoring other students in University subjects in a program set up by that university. Her mother spoke to me the other day and told me that this was due to the experiences she had had at our school and doing the subject she had undertaken.

There are many other stories like this that have come from past students including International students receiving scholarships in other states from the universities they attended. Students attending ADFA and taking on Defence force careers. They have returned to the school and participated in school activities and encouraged the students to undertake the courses that they took while at the school. They have also given examples of where they have used their Maths and Science in the careers that they have undertaken. It is these stories that encourage staff to continue their endeavours and see that the education they have provided has born fruit.

In general, students at our school find the Extended Modelling and Problem Solving and investigations to be satisfying and meet the needs and interests. I have taken some of their work to conferences in Queensland and overseas to a technology conference, I attended in Estonia. This was well received by my international colleagues.

The ability of assessment processes to support valid and reliable judgments of student outcomes

As can be seen from some of the examples I have provided in the previous sections, the results that the students were awarded at school have been reflected in their future success. Student outcomes need to be viewed not just as an attribute of success at school but, hopefully, an indicator of success in future educational experiences and professional conduct.

Assessment needs to reflect the learning experiences that occur in the classroom. If the student is only doing exercises and practicing skills and knowledge, then tests are the best way of doing this. However to provide for the holistic view of the subject and review and check a students application in using that knowledge, there needs to be a range of assessment pieces that can allow this to occur. Providing students with time to expand on a concept, look at alternatives, assumptions as well as the strengths and limitations of models can only enhance their learning. I believe and have seen this occur time and again in investigations and extended modeling situations. It also

allows the lower ability student to achieve some success in the skills that they have learnt because they can be structured to cater for individual ability levels.

In the past we provided Senior subjects for about a retention level of about 30% but in todays educational climate we have a retention well over 90% in most schools. Therefore the range of ability of students entering our courses is quite diverse and we must cater for this. We must challenge the gifted and provide opportunities for success for the less gifted. In the same way we should understand that obtaining a Sound Achievement in a subject such as Maths B is no guarantee of success in a university Science course. I believe that the criteria and standards matrix provides the student and teacher with a clear understanding of the achievement within that subject. It provides a description of the what the student has achieved and provided in the range of assessment they have undertaken.

Conclusion

In my educational experience, I have been through the changes that have occurred since 1970. From External examinations, The Radford agenda, Outcomes Based Education through to Criteria and Standards. I have seen the changes to content and the mix of assessment as a response to that content. It is my belief that we must learn from the past and live in the present and look to the future in order to provide the best education that we can deliver.

There are topics that I have taught in Maths B and C that did not exist in my student years at high school. It was only when I went to university were these topics addressed. I have seen this occur in Biology, Physics and Chemistry as I observed by own children move through the system. I have been proud of their achievements as a parent because of the provision of a quality education in Queensland.

Reviews are important and it should be that the current system is not without fault. However I believe that it provides a basis for providing appropriate standards and achievement levels for the students it serves at this time. In this way, I look forward to improvements, changes and revisions that will make it better. However I hope that we do not repeat the past mistakes and introduce ideas that have caused unfairness in the system.