

**Submission to the Inquiry into Education in Queensland, including Assessment
Methods for Senior Maths, Chemistry and Physics**
QLD State Government

April 30, 2013

Dear Members,

I am a scientist. I was educated initially in Victorian schools and at Monash University, before moving to the USA where I trained at Yale University and had my first faculty appointment at Harvard University. Twenty years ago I moved to Brisbane to a research appointment at The University of Queensland. My background and current position (as a university researcher and teacher) are relevant to this submission, however, please note that I make this submission as an individual, not on behalf of my organization. That said, the views I express here, are widely held amongst my science colleagues.

I teach your sons and daughters undergraduate science and train them as PhDs. For the past 20 years I have been flabbergasted by their sub-standard skills in maths and English. I encounter many, many university students who can't work out percentages, and almost none of them have adequate skills in spelling or grammar. Interestingly, I encounter these problems less these days – thanks to the higher numbers of foreign students! I did not understand the general lack of core skills in our university students – until my own son started his education in Queensland schools.

Our experience as parents, watching our son being taught at school here has been nothing short of distressing. We have contemplated moving elsewhere for his education, and having not done so, will probably be forever regretful. Is school education worse in Queensland than in other places? Yes it is. While I believe education standards have slipped across Australia, they have done so to a more marked degree in Queensland. My husband is a Queenslander. He was educated here, completing his training as an engineer in the late 70's . He was educated well during his school years. So, something has gone awry in the decades since.

What is wrong with education in Queensland?

It is 'soft serve' education - sweet, mushy and with no nourishment for brains. The prevailing ethos amongst educators and teachers now seems to be keeping kids happy (babysitting) instead of teaching them knowledge and core skills. Core skills teaching and testing has given way to mushy assignments (homework for parents) as a way of keeping students busy and avoiding detailed examination of what they have actually learned during class. There is no checking to see whether students have mastered one set of skills before moving on to the next. Therefore, there is no way of assessing the students themselves, nor the teachers who are teaching them. Without ensuring that core skills are taught and learned, students are promoted from year to year, their inadequacies ignored and passed over. So, this is how they reach me in university, at the end of their education – still unable to read, write or do basic math.

My son was not taught to read properly in primary school. His 4th grade teacher told me that she couldn't teach him to read phonetically because she hadn't been taught this herself. Reading by dissecting sounds and parts of words is an essential skill, it is

the only way of giving young students a core technique they can use to dissect increasingly complex language. Students who are taught phonics can read out loud, comprehend what they read and tackle new words confidently because they have an appropriate skill set. The replacement technique taught in Queensland schools (but not in other States!) is to teach students to ‘recognize’ words. This is empirical guesswork, not a translatable core skill. Although the current enquiry is about maths, chemistry and physics, I mention reading and English because the down-turn in education quality, the lack of rigour and method, are reflected across all subjects in school education. Together, they show a complete eschewing of wanting to teach knowledge, facts and core skills, for alternative outcomes that are poorly defined, individualized, immeasurable and not useful in more advanced education or in careers.

My son did no rote learning at school. Now considered ‘unfashionable’ and ‘boring,’ rote learning is in fact uniquely powerful at building neural networks and imprinting knowledge in our brains. For things like learning ‘times tables’ in maths it is a wonderfully efficient and time-tested way of implanting core knowledge that will serve a lifetime. Students who have instant recall of core knowledge from things like learning times tables, can tackle increasingly more difficult maths with confidence. My son was never taught times tables in primary school maths and now in senior secondary school he still doesn’t know them. The same is true for other basic maths and science precepts. The rigour, repetition and testing necessary to impart core information is missing from maths and science teaching. Consequently, knowledge, ability and confidence are lacking in today’s school graduates.

The ‘soft serve’ education has my son’s maths being assessed by assignments and his English being assessed by drama presentations. Are the educators and teachers lazy or misguided or both? My son has no way of judging how good or bad his core maths or English skills are – and neither do his teachers. Devolving teaching to ‘home assignments’ isolates the learner and leaves students adrift, not having a strong peer group environment for their learning or development at school. Are they the best in the class or the worst in the class? Is their level of knowledge adequate? They don’t know, the teacher doesn’t know and we, the parents, don’t know. **Queensland’s ‘soft’ marking system has made sure that none of us ever know the answers to these questions.**

How to fix education in Queensland? Throwing lots of money at schools without fixing education itself will not address the problem. This problem is all about content –what students are taught at school, and all about the quality of teachers in the system. Reintroduce core skills teaching for students all the way from primary school through secondary school and reintroduce testing and examination at every level. **Testing is not bad - it is empowering – for students themselves and for the teachers.** Ensure that each student has the necessary skills before they move on. Measure teacher performance through the testing of their students. Retrain the teachers. Demand higher entry levels for teachers training at university, and ensure that the teachers themselves are well qualified before they go out to the schools. Pay teachers more. Bring back retired teachers part-time to help in classrooms and in teacher retraining. **Put maths back into maths and English back into English.** The introduction of the national curriculum will certainly help, but Queensland schools have a very big problem to fix.

Globally, countries like Australia, are moving rapidly towards knowledge-based economies, high skill professions, new technologies and innovation in every industry. Queensland has a wealth of high tech resources and exceptional expertise (mostly imported) that stand it in good stead to compete in this future scenario. However, left to its own devices, with its current education system, Queensland and Queenslanders are getting dumber by the minute. The solution is not a high tech one – it is quite the opposite. It is to go back to basics, to teach core skills and knowledge as the building blocks for future innovation.

So, as a university professor but much, much more urgently as a mother, I urge you to take action to fix education in Queensland.

with regards,

Jennifer L. Stow, PhD

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To: The Parliamentary Education and Innovation Committee
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Summary: (Soft-serve education versus knowledge, core skills, frequent testing and action)

My view is that the assessment processes described in the Maths B syllabus are invalid and unreliable. The assessment of this subject mirrors the 'soft-serve' ethos across many subjects in Queensland education where hard core facts, figures, rankings, success rates, knowledge and abilities are eschewed for more ephemeral, less realistic and completely uninformative measures. Information is power; without exact information about how much maths my son actually knows, as a parent, I am powerless to ensure his education is adequate.

About me:

I am a scientist. I was educated initially in Victorian schools and at Monash University, before moving to the USA where I trained at Yale University and had my first faculty appointment at Harvard University. Twenty years ago I moved to Brisbane to a research appointment at The University of Queensland. My background and current position (as a university researcher and teacher) are relevant to this submission, however, please note that I make this submission as an individual, not on behalf of my organization. That said, the views I express here, are widely held amongst my science colleagues.

Main observations

I teach your sons and daughters undergraduate science and train them as PhDs. For the past 20 years I have been flabbergasted by their sub-standard skills in maths, science and English. I encounter many, many university students who can't work out percentages, and almost none of them have adequate skills in spelling or grammar.

- Compared to schools in Victoria and in the USA, the mathematics standard of school leavers in Queensland is significantly lower.
- When I teach undergraduates I find that they lack the ability to do high school algebra, add fractions, work out percentages, do basic statistics or understand data analysis.
- To assess school mathematics, the most appropriate way is to conduct a test, add up the marks and report a percentage. This is the only way of empowering students (and teachers and parents) with information about exactly what facts and skills they DO NOT YET know, how they compare to their peers and what remedial action needs to be taken. Learning

maths is not a 'feeling,' it is a factual exercise and needs to be assessed as one.

- Grading mathematics through the tables of paragraphs p34-36 of the attached Maths B syllabus is absurd, subjective and problematic.
- At the high school level, written assignments do not develop fundamental mathematics skills as well as repetition, regular homework and study for tests.