SMC&PA Submission 156
Received 12 May 2013

I am a Qld mathematics teacher, and I am very concerned that students in general are losing the ability to do maths, and that our assessment systems are gradually adjusting to try and cover this up. Some points that I think need to be addressed are:

Allowance of calculator in exams The reliance of students on calculators is probably the biggest cause of the decline in general mathematical ability in our state. Knowing your mental maths is what makes mathematics enjoyable, because you feel accomplished and because it's fun. And if basic maths is not automatic, and students have to pull out a calculator for a simple calculation, they lose the thread of what they are doing, and struggle to learn larger concepts. What's more, if you cannot understand mathematical principles properly if you do not use them in calculations, certainly not well enough to understand and use algebra well. We should include some non calculator exams in senior to force students and teachers to address the alarming shortage of arithmetic skills amongst even our senior maths students.

The test and forget culture is a very big problem in maths, a subject that relies on prior knowledge. More and more the teachers I work with and I despair at having to teach content to students who do not know the pre-requisites. Part of the problem is that students are tested every term and are not expected to revisit this knowledge until we build on the topic a year or so later, by which time they have forgotten it. We should be aiming to have semester exams, and yearly exams, and even two yearly exams to promote actual mastery of the subject matter.

Criteria based marking is a very poorly thought out reform in maths and science, and it discourages rigour amongst teachers and students in these subjects. The problems with criteria based marks in maths include:

1. It is very difficult to place students fairly, in a band. How does one decide, looking at a range of questions, that one student has performed a certain skill with "some accuracy" or "partial accuracy"?
2. The students do not understand how they have been marked, which means they do not learn from their mistakes. At least with marks they can see where they went wrong. If the paragraphs are difficult for teachers to decipher, they are incomprehensible for students. My students repeatedly ask for marks instead of criteria.
3. Often the criteria do not accurately reflect the effort being put into the exam, because criteria are based around different topics. I recently had to mark an exam based on three criteria, one of which represented about 6 weeks of work in class, and most of the paper, another that represented half a lesson, and another that represented about two lessons. After that an average was made on all three.
4. The criteria focus on a certain skill although maths questions often include several. Smaller skills are being left out of the marking process, and therefore students are receiving no positive feedback for their attention to detail that translates to a higher level of mathematical ability.

5. When you have D standard, C standard etc questions, there is no good way to find an average grade when a student performs well on some higher standard questions and badly on some lower standard questions. It only works in theory when a student gets all the questions right up to a certain level.

The Communication and Justification grade I think that this grade should be dropped from the system. It is vague and creates "double dipping" where students are penalized, or rewarded in knowledge and problem solving and then penalized or rewarded again in Communication and Justification. There is no consensus amongst teachers about what to do if a student has set out their work very neatly and clearly, but has got most of it wrong, or has not answered large parts of the paper, so we are forced to take into account their knowledge and problem solving marks when coming to a communication result. Knowledge and Problem solving marking systems (prior to criteria based marking) already can and do take account of communication and justification. More often than not, the C&J grade is one higher than what they have already received, and serves to inflate students results, again discouraging rigour in our schools.

Assignments in senior maths are a good idea in principle – allowing students to come to a deeper understanding of some concepts, but we must acknowledge that there is a very large system of QLD tutors who often do more of the assignment than they should. This means that not only are students who do not receive extra help being treated unfairly, but many students' marks are being boosted when they should not be. This allows more students with poor mathematical skill to pass, and thus helps enforce poorer standards in QLD schools.