New maths curriculum a feeble tool calculated to bore

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On Monday, after almost two years of work, a draft of the new Australian national curriculum was released. As maths lecturers deeply dissatisfied with the state of Australian education, we were keen to see what would emerge.

Keen, but pessimistic. We were concerned about the almost total lack of involvement of mathematicians in the writing process and unimpressed by the background documents, which displayed a disturbing ignorance of mathematical culture.

Our doubts have unfortunately been confirmed. We are convinced that implementing such a curriculum will do little to improve the woeful state of Australian mathematics education.

The substance of the draft, which covers prep to year 10, is in the year-by-year syllabus, with an "elaboration" of each point: the syllabus point indicates "what" is to be taught; the elaboration suggests "how" it is to be taught. The syllabus itself is divided into three streams: number and algebra, statistics and probability, and measurement and geometry.

These artificial divisions, while necessary, have led to an unnecessary dissolution of the syllabus; every part of every stream is addressed in every year. The few concepts in the statistics syllabus, for example, are continually drip-fed over 11 years. There is simply no reason for "data" to be collected and analysed over and over again.

A more central problem with the syllabus is what is emphasised and what is de-emphasised, or omitted entirely.

To illustrate, consider the approach to calculators and technology. We shouldn't need to say it, but pushing buttons on a calculator is not doing mathematics: it may (rarely) be a "how", but is never a "what". Yet, "calculator" appears time and again as a core concern of the syllabus.

By comparison, reasoning involving proof - the one compelling argument for teaching mathematics - is reduced to elaboration, just another method of getting to a (usually boring) fact. This technology ramming extends to advocating the use of calculators to introduce adding in prep, a suggestion so appallingly misguided it beggars belief.

The technology fetish goes hand in hand with another major problem with the draft curriculum: a preference for "practical" mathematics at the expense of more fundamental and ideal concepts.

As a consequence, number (mainly arithmetic) crowds out algebra, measurement crowds out geometry, and statistics swamps everything. This emphasis on supposedly useful mathematics is seriously misguided. The result is an unbalanced, ugly, bitsy, pseudo-applied curriculum. It will constitute woeful preparation for students continuing maths beyond year 10, and we predict it will bore the pants off everyone.

We have many specific objections to the draft curriculum. Here is but a sampling. We cannot see why times tables have been shoved out to make room for "multiplication facts", nor why multiplying by 7 alone is omitted from the year 4 syllabus, nor why the 11 and 12-times tables are never even implicitly referred to. We wonder why "theorem" - the central concept in mathematics - only ever appears with "Pythagoras", and why the proof of this one theorem is merely an elaboration. We wonder why pi and real numbers and irrational numbers barely get a mention.

We also wonder why there is a pandering to indigenous Australians while the major Chinese and Arabic contributions to mathematical wisdom are ignored. Why isn't Euclid or any mathematician (other than Pythagoras) ever mentioned by name? So much for presenting mathematics as a human endeavour.

Attempting to sell mathematics by imposing an artificial concreteness, by inflating the importance of calculating bank interest, is simply farcical.

Just as children best learn to read by experiencing the joy of great stories, they best learn mathematics by experiencing its beauty and the joy of mathematical play. But in this curriculum there is little sense of the fun and the beauty of mathematics. Not a hint of infinity, of the fourth dimension, of Moebius bands, of puzzles or paradoxes.

Why? If mathematics can be taught as ideas, as something beautiful and fun, then why is it not being proposed? Because it is difficult to do. To teach real mathematics makes demands on the teacher, and it is risky.

What is proposed is little more than a cowardly version of current curriculums, a codification of the boring, pointless approach - which is "safe" but which has already failed a generation of students.

The draft curriculum begins by declaiming the beauty and intrinsic value of mathematics, and the elegance and power of mathematical reasoning. But as a means of unfolding all this before our students, the proposed curriculum is a feeble tool indeed.

Burkard Polster and Marty Ross write the Maths Masters column for Education Age online at theage.com.au/education. Their work can also be found at www.qedcat.com