
‘Mastery Mathematics’ – but Who is the Slave?

JULIAN WILLIAMS

ABSTRACT This article explores the development of ‘mastery mathematics’ – a significant development in mathematics in England – and opens up some questions about the intended and unintended consequences of the promotion of this approach by the government.

Have you heard of ‘mastery maths’? You might think it is the latest fad, the latest government imposition or the latest resource for learning mathematics. Maybe it is all these things? You can go online and check out what is being sold: you might like some of the ideas yet also object to others. But this is where the money is; the government has decided that the continuing professional development budget for maths is to be spent this way, so this is ‘it’.

The National Centre for Excellence in the Teaching of Mathematics hubs seem heavily involved in shaping it in practice on the ground, but they are constrained by the programme’s national commitments, which have been shaped by Shanghai and Singaporean influences. I have heard that the programme gets its support because the ministers who supported it thought that it involved children sitting in rows being taught together through ‘direct instruction’, being properly disciplined and learning by rote. From what I see, however, there seem to be some good things in this system – in particular, some texts and approaches are inspired by Skemp and Bruner and their aficionados in the Association of Teachers of Mathematics, adapting many of these ideas from the 1970s (see, for example, Skemp, 1976). There are also western influences such as the concept of ‘variation’, developed by Ference Marton and others, which now boomerang back to us from Shanghai. Well and good! The Singapore programmes emphasise what Skemp (1976) refers to as ‘relational understanding’ (real understanding of mathematical concepts and how they relate) to underpin the instrumental numeracy – even the recall of times tables –

that Conservative education ministers value so highly (see Marton & Booth, 1997; Watson, 2017).

Not so long ago, a teacher asked me if I thought ‘apparatus’ was still ‘in’ for good maths teaching; their school was very much ‘into’ their whiteboards and so on. I was shocked. Well, manipulating manipulatives are certainly ‘in’ again in Singaporean maths.

The notion of the whole class moving together through the essential curriculum also feels right by equitable criteria – a true ‘no child left behind’ policy approach. Then who would complain about there being textbooks to support the teaching? Surely materials that are well designed and crafted by informed praxis should be welcomed as resources even for the most independently minded and resourceful teachers.

Even more positive, the fact that the Pacific Rim teachers tend to have a culture of research and lesson study in their professional practice is not to be sneered at – if only this kind of professional development was significantly resourced here (clearly, this is not going to happen under the present government).

So, in this case, I think that there is good reason to support work on ‘fluency’, which is understood to be emergent from experiences that are relational. Skemp never meant, I think, to suggest that instrumental mathematics does not have a role, but I think he saw that it was limited if it did not engage with relational understanding, like ‘having procedures’ without ‘knowing why’ the procedures work and sometimes might go wrong. Consider the 17 times table, not one perhaps that we have learnt by heart or rote. But perhaps it would be good to experience trying to do so? So, $8 \times 17 = ?$ On the other hand, I know that $17 \times 10 = 170$ and $17 \times 2 = 34$, so 17×8 has to be 34 less than 170, or 136. This is ‘obvious’ knowledge that flows from relational understanding to support instrumental working. Surely pedagogy should encourage it. This is a ‘knowing by heart’ that is genuinely mathematical, in contrast to learning by rote that is quite otherwise because it has no basis in mathematical reasoning and so undermines mathematical ‘sense’. Perhaps we should call it mastery but not mystery.

So, what should we really worry about in ‘mastery mathematics’, given that many of the ideas it promotes seem to be, arguably, well founded and persuasive? For myself, what I worry most about is that ‘mastery’ is not only mastery of mathematics per se but mastery of the teaching–learning partnership or relationship. ‘Mastery’ sold as good practice seems to be yet another means of telling teachers and learners how they should do things, because this is believed or has been shown to be ‘effective’ (in somebody’s hands). In other words, what is wrong with ‘mastery’, for me, is what is wrong with the whole policy discourse about ‘what works’ and ‘best practice’, which is often propagated in a regime that actually has very slim evidence or authority to make these claims. The policy becomes the master of us all, and we are obliged to suspend our critical faculties and comply.

I think what is wrong with 'mastery maths' is close to the concept of the dialectic of master and slave: both are alienated from their labour as well as from each other. In mastery mathematics, who is master and who is being 'mastered'? Who is the 'slave'? It worries me that the people who are absolutely central to learning and teaching are not given agency, not given the control, and not invited to be critical of this whole new narrative of 'best practice' which marginalises their judgement. The teachers and learners are not the masters here. Are they, then, the slaves to their masters, working for their institutions or, as Ian Stronach once put it, 'doing their sums for their country' in the Programme for International Student Assessment, Trends in International Mathematics and Science Study, and national tests?

The direction of policy, at least in recent decades (and this has been true of the Blair governments as much as of its expansion in the years since), has been to treat the profession – the teachers and classroom practice – as the object of change rather than its agent. Barrow (1984) wrote *Giving Teaching Back to Teachers*, in which he appealed to researchers not to steal teaching and judgement from teachers. Everything said there applies even more emphatically now, with 'researchers' being replaced by what-works technicians, managers and policy.

We also need to give learning back to students, because the control of teaching from outside robs learners of agency or mastery just as much as it has done teachers. Becoming the ever more compliant 'deliverers' of a given best-practice pedagogy and national curriculum driven by tests, the freedom of the teacher disappears. So does the freedom of the student to learn; motivation becomes a technical job for the teacher, an instrument to harass the learner into learning what we claim they need to know. We are no longer allowed as teachers to conceive of the diverse ways we might teach, and the many ways our students might learn, because best practice tells us how it is normatively effective, and anyone who does not comply – well, that is fine, but they have to have a convincing reason to press back against the weight of the world and its 'evidence'.

And yet the evidence is remarkably slim. Arguably, the most important factor in effective learning and teaching is a powerful (and relatively 'unalienated', if that is possible) relationship between the teacher and the learner; some call this 'love'. If the intrusion of mastery into an effective teacher–learner relationship serves to undermine this, then I am sure it will prove ineffective – though I wonder if this will be detected by the kinds of evaluation and measurement widely employed to evaluate effects.

In conclusion, what I am arguing is not really 'against' the current trends for mastery maths particularly, but 'for' a renewal of a different kind of professional development, where the agency of learners and teachers is more obviously respected as the vital agent of real learning. I urge for the critical examination of the imposition of mastery maths and other such slogans and programmes insofar as they purport to have the ultimate answers to developing practice, leaving teachers with a purely technical task of 'delivery' and

presumably reducing learning activity to 'package-opening' functions worthy of a future menial workforce and compliant citizenry.[1]

Note

[1] This article first appeared in *Education for Tomorrow*. See <https://educationfortomorrow.org.uk/>

References

- Barrow, R. (1984) *Giving Teaching Back to Teachers: a critical introduction to curriculum theory*. London: Routledge.
- Marton, F. & Booth, S. (1997) *Learning and Awareness*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Skemp, R. (1976) Relational Understanding and Instrumental Understanding, *Mathematics Teaching*, 77, 20-26.
- Watson, A. (2017) Pedagogy of Variations, in R. Huang & Y. Li (Eds) *Teaching and Learning Mathematics through Variation*, pp. 85-106. Rotterdam: Sense. https://doi.org/10.1007/978-94-6300-782-5_5

JULIAN WILLIAMS is Professor of Mathematics Education at the Manchester Institute of Education, University of Manchester. *Correspondence:* julian.williams@manchester.ac.uk