

Cambridge Maths Hub Case Studies 2020/21

LLME / Primary Tfm

Beth McGreer is Assistant Head with responsibility for Inclusion at a Cambridgeshire primary school, and in addition to teaching Maths has the roles of SENCo, Deputy Safeguarding Lead and line management for Teaching Assistants.

Beth is a Teaching for Mastery Specialist and Assistant Teaching for Mastery Lead with Cambridge Maths Hub, and one of our Local Leaders of Maths Education.

She has also led a Department for Education KS1 & KS2 school Improvement Project.

This Case Study began in early 2020 and was completed as that exceptionally challenging year drew to an end - so whilst not the original intention of the study, it also reflects on the impact and experience of teaching during the COVID-19 pandemic.

Beth's teaching journey

I qualified as a teacher, in South Africa, in December 2000, with the first day of my teaching contract being 01.01.01 (how pleasing on the eyes!). After teaching in the equivalent of KS1 for two years I moved to Cambridge where I have taught for 18 years.

My UK teaching experience includes a few months of supply teaching, 4 years teaching (predominantly Maths) at a special needs school in Years 7 - 11, and 12 years in mainstream schools from EYFS - Year 2 as a class teacher.

For the past 16 months I have been in the privileged position of teaching only Maths to a different year group (from Years 1-6) each half term; the intended purpose being to develop the teaching for mastery approach across the school. Unfortunately this long term CPD project has, like most things, been hampered somewhat by the Covid pandemic.

What do you feel are the major challenges facing the teaching of maths currently?

I was initially asked these questions just before school closures in March 2020 and this was my response:

- The curriculum is tough: the most challenging aspect is that there is a huge quantity of material each year group is required to cover. The time allocated does not allow for all concepts to be fully embedded or connections between them made by most pupils; let alone allowing for additional support for those children who need more practice than their peers. This is in addition to the requirement that some complex concepts are possibly introduced before children are mathematically or developmentally ready to understand them (e.g. fractions in KS1).
- While the national curriculum is not as prescriptive as in other countries (therefore giving teachers more ownership) this presents its own challenges in interpreting the list of objectives. As teachers we spend a lot of time on deconstructing the objectives into smaller steps before we can begin to consider how to deliver those smaller steps. The structure of the curriculum makes it harder to ensure coherence over longer periods of time (ie. across year groups).
- There is an over-reliance on summative assessments to show worth. This does not

match with the overarching aims of the Maths curriculum but rather encourages teachers and schools to teach tips and tricks in order to pass a test and to keep clear of an Ofsted 'bashing', rather than deepening conceptual understanding of the structures of maths (e.g. 'flip and switch' in fractions).

- The majority of teachers who teach primary school Maths are not Maths specialists (I'll reserve my views on whether I think they should be - as they are in Shanghai for example - for a future blog). Regardless of their academic qualifications and personal level of mathematical understanding, those who are not Maths specialists may not have the necessary depth of understanding of how to teach Maths. While this is being addressed through the work of the Maths Hubs and publications like the NCETM Spines, there is some way to go before all primary school teachers have the necessary depth of subject knowledge; and there seems to be a gap in the initial teacher training in relation to this too.
- Time: not only do most class teachers have 11 subjects to plan, teach and assess; they also have the emotional health and wellbeing of children to nurture, displays to put up, school trips to arrange, parents to meet, school plays to produce, break duties to do, CPD to attend and deliver, pupil progress meetings to attend, appraisal targets to achieve, data to analyse, as well as a myriad of other tasks and responsibilities to carry out. There is little time for the level of reflective practice needed to wholly ensure the Maths curriculum is delivered as best it can be.

Fast forward to December 2020....

My how things have changed. The Department for Education has released guidance for teaching Mathematics and this goes some way to resolving the challenges highlighted above. The guidance (and related NCETM exemplification materials) highlight the most important criteria children need to understand in order to progress successfully through the curriculum. While the national curriculum itself remains statutory (and too large), teachers are in a better position to know which aspects to give the lion's share of teaching time to; and which aspects will allow the rest of the curriculum to become more accessible. In addition, the guidance brings much needed coherence in terms of content, representation and language structures while at the same time giving opportunity for developing teacher subject knowledge.

The barrier of time for effective planning and teaching of Maths remains; and, if you can believe it, seems more challenging than ever.

With school closures for such a prolonged length of time children have, unsurprisingly, returned to school at very different places within their Maths learning. Some have continued to develop their understanding through diligently completing work set during school closures, some children have done nothing at all and others have tried but have returned with little retention of what they had previously covered, or have developed misconceptions and only surface level understanding of the concepts covered at home.

Now, as well as delivering an already overloaded curriculum, teachers have the responsibility of catching these children up from various starting points, while remaining at a distance and giving up about a twelfth of each day to handwashing.

Describe your first encounter with the Cambridge Maths Hub

I was introduced to the CMH through being a 2014-2015 participant in, what was then, the one year 'teaching for mastery' programme delivered by a Cohort 1 Maths Mastery Specialist. The idea of learning from colleagues to develop learning in a peer-to-peer, non-judgemental environment without a hidden agenda was, sadly, a unique experience for me.

Seeing the lead teacher in a mastery style was very different to any lesson observations that I had seen previously; in fact, I thought it was terrible! So little content was covered in a lesson. I'd been so programmed into valuing pace, five way differentiation, starting with something challenging that the children couldn't do in order to show progress, flying through the curriculum as quickly as possible, and children being required to produce an excessive quantity of work in a lesson in order to show learning - that I couldn't see the value of what **was** within the lesson as I was so clouded by what 'wasn't'.

By the end of my first year of working within the Teaching for Mastery programme I was far less skeptical and could see the value of the smaller steps, the explicit and clear teaching of vocab and how it led to the children's ability to justify and explain their thinking. I could see the benefits of teaching in that way compared with the style I had been drilled in. My previous thinking had certainly been shifted and my focus was now on the structure of the lesson design.

Describe your role within Cambridge Maths Hub

In 2019-2020 I was seconded to work for the CMH for 30% (a day and a half per week) - my official title was Assistant Teaching for Mastery Lead. I moved into the role because in the years between my first encounter and September 2019 I had trained as a Mastery Specialist myself. I really enjoyed sharing ideas and the passion for teaching maths in this way - converting and inspiring others and seeing the impact it has on the children - especially those who were traditionally perceived as "no good at maths" gives me such a buzz!

I had also moved to a larger school at this point and my role of Assistant Head allowed more scope to consider a secondment. One of the biggest appeals of working with the CMH in any capacity is the ethos of teacher-to-teacher professional development through collaboration in a psychologically safe environment; I wanted to be even more a part of that.

In 2019-2020 I worked with 5 schools leading the Developing Teaching for Mastery Work Group programme, and with 4 schools who were completing the Embedding tfm Work Group (having previously been in my Developing tfm Group) and I led a Lesson Design Work Group. In addition to this I was the Lead for 1 school on the DfE KS1&KS2 Improvement Project.

Ultimately my work is about supporting teachers to be confident Maths teachers so that children can love maths and be successful at it. Teachers' feedback on what they most enjoy or benefit from is observing and discussing maths lessons - because they get to see the principles "in real life" rather than just talking hypothetically - real kids and an actual maths lesson, not something recorded in seven takes. Last year, some of the participants volunteered to teach at our Teacher Research Group sessions; it's been such a privilege to see those teachers on the journey from having no idea what Teaching for Mastery was, to becoming so confident in using tfm that they were willing to share this for the benefit of other participants.

In my role I get to see the impact of a year (or more) worth of professional development on teaching practice and by default the increased engagement, motivation and understanding of maths in the children - what's not to love?

Has your involvement with CMH made a difference to your practice, motivation or wellbeing?

Yes, of course. I think, plan and teach in a style very different to that of a handful of years ago: the biggest changes are increased confidence in my own subject knowledge, how key it is to identify difficulty points and teach to them (to avoid common misconceptions), the use of representations to make explicit the structure of maths and the focused use of language and stem sentences.

My planning is different because it has moved away from the 'starter, teach, do' plenary recipe to a much more fluid 'ping pong' style approach - every little step within the lesson has been considered; there's much more coherence and the representations and images have been chosen carefully. In the past, I might not even have had representations let alone spent time considering which the best ones to use would be.

The biggest motivation is seeing the children who would have traditionally been in the 'booster' group or who were just not quite 'getting it' being much more confident. They're not being put off maths in primary school. It's making such a difference for them.

My experience with CMH and the NCETM (including my visit to Shanghai through the exchange programme) has been by far the best CPD I have ever had - it has genuinely reinvigorated me as a teacher. It came at a time when I was really disillusioned with the profession and was dreaming of an exit plan.

In the past, I would comply with following a quick fix ill-thought-out initiative in order to 'raise standards' because I was told to, rather than considering whether there was any value in it. Now, I question and reflect more.

I follow the Teaching for Mastery approach because I believe in it, not because it's 'on trend'.

Describe the impact on your students, colleagues and school

The children have improved attitudes towards maths and seem more engaged and willing to try. Using phrases like 'the answer is only the beginning' and saying 'and that makes you a great mathematician' when they pick up on and can reason through their own errors has supported them in moving away from a negative maths mind-set. They genuinely see themselves as mathematicians now - they feel it rather than simply hear it.

My work with teachers in my own school has impacted differently on different teachers and classes who were at different points in their understanding of maths mastery - I feel more confident in being able to offer informed advice to colleagues based on my experience, CPD and reading.

We haven't seen huge improvements in the data yet but we are setting children up to be better mathematicians in the long-term and have seen much greater engagement, number sense and verbal reasoning (rather than just a higher score on their test papers - though we hope this will follow as we embed the approach within my school).

Describe how and where your role in CMH has most helped you to make a difference

Leading Teacher Research Groups: the feedback from participants' evaluations (for individual sessions and the year's work as a whole) show that schools want to continue their involvement.

I can see the difference in practice and teacher confidence when I observe teachers. For example, when I first started working with a Year 4 teacher in one of my Work Groups, she felt she was using teaching for mastery and fully understood it. She realised throughout the course of the TRG that she had overestimated on her initial assessment because she hadn't had the depth of understanding of the principles of teaching for mastery that she does now. I recently observed a lesson of hers and it was fabulous - it applied all of the five big ideas, using bar models to interpret word problems. She is now considering applying to become a Maths Mastery Specialist.

How would you describe the unique selling point (USP) of Cambridge Maths Hub?

Cambridge Maths Hub is by teachers, for teachers. Practising teachers genuinely collaborating, asking questions, making suggestions, challenging and supporting one another.

How would you like to see Maths Hubs developing in the future?

We need to get involved with initial teaching training.

What are your professional priorities for the coming two years?

Keep going! More of the same - developing the teaching for mastery; hooking in more tfm converts.

I'm pleased I've been able to continue my CMH secondment into the second year. I've found my feet now but need to use more research to support the depth and breadth of my understanding.

And finally, anything else you would like to add?

Thank you CMH for supporting me to take my career in a direction that is more 'off the beaten track' than I could have envisioned even 3 years ago.

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