Improving mathematics teaching

"For all those involved in education, from the Secretary of State down to the parent-teacher association, there should be no greater priority than nurturing and retaining brilliant teachers. We should be offering them the best possible training, supporting them in any way we can and systematically removing any burdens which stand in the way of their success."

The Teacher Gap

Allen and Sims 2018

Context

Maths attainment is increasingly important for young people as many employers and higher education institutions demand a high standard of numeracy and mathematical understanding. The Cam Academy Trust, based in Cambridgeshire, has taken a proactive approach to improving maths provision in the region.

About the Cambridge Maths Hub

The Cambridge Maths Hub, based within The Cam Academy Trust, has connections with 541 local schools based in and around Cambridgeshire. It was set up alongside other Maths Hubs in England to provide professional development for maths teachers. Cambourne Village College was chosen as the Hub's base for the Trust due to its strong mathematics department and strategic location.

The Maths Hub covers Early Years right through to Post-16 education. Throughout the year the Hub runs collaborative Work Groups that encompass a range of key stages and topics. All Hub leaders are teachers themselves. The Work Groups explore topics as broad as Teaching for Mastery and Mathematical Thinking to specifics like fractions or multiplicative reasoning. All professional development is free to schools and funded through the Department for Education.

A typical Work Group will consist of 10 to 20 teachers from at least six schools. They will explore an area of pedagogy together and look at the related research. The teachers will discuss misconceptions; how these can be unravelled and how they can be used to secure deep understanding in ~~their~~ students. The teachers may well analyse some resources. Participants will leave the Work Group with a task that needs to be carried out in their classroom before the next session. At the next session the task will be discussed and student responses analysed. Where possible, lesson study will take place with an emphasis on student learning and supporting one another.

The Cambridge Maths Hub Lead, Cordelia Myers, said: "It is humbling to see the positive effects that the Hub is having both on teachers and students. We are fortunate in the region to have many high-quality maths teachers across all year groups. The role of the Maths Hub is to capitalise on this, developing and training these professionals so they can support others."

Impact of the scheme

The Hub has high rates of engagement with over 70 per cent of the schools in Cambridgeshire taking advantage of its Work Groups and conferences. An impressive 98 per cent of these Headteachers said the Teaching for Mastery programme has had a positive impact on their school.

The opportunities for developing leadership within the Hub has kept teachers in the classroom. It has also increased the region's leadership capacity within maths. The main Hub leadership team of 14 teachers from 12 different schools represent six academy trusts.

The Work Group leads represent 39 schools from across the region. They meet termly to plan and gain an understanding of the bigger picture of maths education. This provides them with an opportunity to collaborate, to think through aspects of maths across the age range and to reflect on good practice.

Feedback from Work Group participants

"It is not often that teachers are given the time and space to spend reflecting on and developing their own practice. The participants have been able to do just that with regards to developing their own understanding, subject knowledge and confidence with planning and delivering quality maths lessons." A primary maths lead.

One of the secondary Work Group participants wrote: "The CPD provided to date has been outstanding. After teaching for ten years I didn't realise how powerful these approaches to improve maths reasoning for pupils could be."

Using Maths Hub expertise to support primary schools

Alongside the work of the Maths Hub, Cam Academy Trust has worked with the Department for Education to support twenty--nine primary schools and all nine secondary schools in the Opportunity Area. Using the expertise of the Maths Hub, the Trust has supported these schools with intensive maths professional development (PD) and bespoke guidance.

Primary teachers attend PD days on Teaching for Mastery, problem solving, calculation and lesson study. Each school has a PD lead assigned to them who visits every half term and works with the maths

lead to support and develop maths teaching across the school. The secondary project works with similar themes and PD is offered to the whole department each half term. Each secondary school also has a PD lead who works with the department on collaborative lesson planning and developing reasoning.

Feedback from a Maths Lead: the project is not in any way judgemental or critical; instead it is conducted in a thoroughly constructive and positive way, enabling those taking part to reflect and develop their own practice in a secure framework of support.

Feedback from a Headteacher: During the course of the project, teaching in all classrooms has changed. Teachers are now teaching for deep conceptual understanding and every lesson contains reasoning and problem solving, whereas before the teaching was very procedural. As a result, the children are now able to explain their reasoning, and record it clearly in sentences. The children are also more confident to tackle problems and are prepared to "fail" and try again. Teachers spend longer on each topic, and are making links between topics explicit.

For more information about the Maths Hub visit www.cambridgemathshub.org or follow on Twitter @CamMathsHub

[1]https://epi.org.uk/publications-and-research/secondary-school-performance-tables-2018-disadvantage-gap-widens-in-english-and-maths/.

[2]https://schoolsweek.co.uk/disadvantaged-pupils-maths-attainment-sees-england-fall-behind/