

# The NCETM Maths Podcast Episode 85

## Evaluating Maths Hubs' impact with the EEF

**Julia Thomson:** Hello and welcome to the NCETM Maths Podcast. I'm Julia Thomson [JT] from the NCETM Communications Team, and in this episode of the podcast, I'm inviting you to listen into a conversation with NCETM colleagues involved in the trials funded by the [Education Endowment Fund \(EEF\)](#) of two of the Maths Hubs' most important programmes, taking place in the academic year 2025/26.

Is education research, exciting? Well, we think so. All Maths Hubs' professional development is underpinned and informed by research. So, as the programme heads into its second decade, it definitely feels like the right time for an independent evaluation of Maths Hubs' work. And as someone who's never been involved in education research or research trials myself, I found learning about the process and what's involved genuinely interesting.

Whether you're a seasoned statistician or an interested teacher who's fairly new to how these things work, I hope you'll find this episode interesting too.

Now let's jump into the conversation.

**Jen Shearman [JS]:** Hello, I'm Jen Shearman and as part of my role as Director for Evaluation and Impact at the NCETM, I'm the overall lead in liaising with the EEF on these trials.

**Paul Rowlandson [PR]:** Hello, my name is Paul Rowlandson. I work for the NCETM in the School and Professional Development Team, and I am the project lead for the [SKTM Secondary Non-Specialist Teachers Programme](#).

**Sue Evans [SE]:** Hello, I'm Sue Evans and I work on the Primary Team here at the NCETM, and I'm the Project Lead for [Mastering Number at Reception and Key Stage 1](#).

**JS:** So, let's kick off with the questions. Paul, my first question is for you: tell us a bit about the EEF, what kind of organisation is it, what kind of trials do they fund and why?

**PR:** The EEF is an independent charity that aim to be a bridge between research and school practice. They synthesise a lot of research that's already been done. It's already out there and report it in ways which are applicable and easy to interpret from a school point of view, for example, as blogs or as reports of some kind.

But they also fund new research, such as what we're looking at in today's podcast as well. The preferred method of research tends to be a randomised controlled trial, an RCT, and that's based roughly on the sort of methods that are used in medical research, where you've got a group of people, they're split into two groups: one receives an intervention, the other doesn't receive an intervention.

Then you look at the difference in impact, but the randomised controlled trials are not without controversy. Some academics very much champion RCTs as a method in education research, but some academics do caution against what can be generalised from it. The EEF does more than just RCTs: they have to measure pupil impact, which they do by reporting it as months of learning, but they also measure other things as well. For the NCETM, our programmes look at impact on teachers, and that's particularly important to us, as well as the impact it has on pupils.

So, Jen, that's the EEF. Why have the NCETM and Maths Hubs become involved with EEF?

**[JS]:** Thanks Paul. The NCETM and Maths Hubs do lots of internal evaluation. We go out and visit Work Groups and schools, we do surveys, and we ask our local leaders of maths education to report on the impact of, of the activity they're doing.

However, some external evaluation is also really important in finding out the impact of the activity that we are doing, and also to think about what we could do more of, less of, and what we could do better in the future. Getting funding from the EEF is really going to allow a rigorous and thorough external evaluation to happen for some of our, our programmes.

So, whilst the EEF funds the evaluations, they won't actually carry them out: the expert evaluators who will actually carry out the trials are from Sheffield Hallam University and the National Foundation for Educational Research (NFER). We're really looking forward to working with them and really utilising their expertise in evaluating our programmes.

We are entirely funded by public money made available by the Department for Education (DfE), so we're really accountable for making sure that taxpayers' money is spent in the right way. We should take every opportunity we can to report on our processes and our impact, and the DfE is very enthusiastic for external evaluation, particularly funded by the EEF, because they have a mission to break the link between parental income and educational attainment.

That's shared of course, by the government and by ourselves. There are lots of evaluation methodologies and ways of collecting data: in the past, much of our activity wasn't particularly suitable for the methodologies that the EEF use. The Teaching for Mastery Programme and the Work-Group model where the Maths Hubs work with some teachers who then go and work in their schools aren't really appropriate kinds of programmes to evaluate via a randomised control trial. It's just too complicated, there are too many things going on. More recently the NCETM and the Maths Hubs Network have some projects that are more suited to this methodology, and we have worked with the EEF to apply for funding for these two programmes.

Now we'll tell you a little bit about which programmes have been chosen. First of all, we'll go back to Paul. Why don't you tell me about the programme you lead and why that's been chosen?

**[PR]:** The programme I'm leading is the SKTM, which stands for Specialist Knowledge for Teaching Mathematics, and there are quite a few SKTM programmes within the NCETM and run by the Maths Hubs.

This particular one is aimed at non-specialist teachers of mathematics in secondary schools, where a non-specialist teacher is defined as a person who is teaching mathematics, but they are not initially trained to teach mathematics on their PGCE. For example, they might have been trained to teach geography or PE or something like that, and they've picked up some mathematics on the timetable.

So the SKTM programme looks to upskill them, and develop their pedagogical knowledge and their subject knowledge in tandem with each other and support them in developing the skills as a classroom practitioner of mathematics, and also develop their teacher identity as a maths teacher.

The programme is in response to a teacher shortage in secondary education, particularly for mathematics - and there are many non-specialist teachers of mathematics around the country teaching maths. There's been previous research about where non-specialist teachers tend to be deployed, and it found that there tend to be a greater number of non-specialist teachers working in schools that serve a high proportion of disadvantaged students. There tends to be a high number of non-specialists working in Key Stage 3 classes, and this has been found to be a time when attainment gaps between advantaged students and disadvantaged students tend to widen.

But also, quite often non-specialists can be found teaching the classes with lower prior-attainment as well in Key Stage 3, which tend to also have a disproportionate number of disadvantaged students.

So working with non-specialist teachers through this programme is important for all students, but particularly those from disadvantaged backgrounds because disproportionately that tends to be where non-specialist teachers work. A report from Osted in 2023, [Coordinating mathematical success](#), highlighted the importance of non-specialist teachers receiving subject-specific PD around mathematics, and that's what the SKTM programme aims to do, both in terms of subject knowledge and pedagogical content knowledge.

The hope is that by a non-specialist engaging with this programme, they become a more confident and more skilled mathematics teacher when they are in the mathematics classroom.

At the same time, numeracy is across the curriculum, and pretty much every subject has aspects of numeracy in it, and some subjects have maths questions within GCSE exams as well. So there's also a hope that the programme may even support these teachers in their 'home' subjects, developing numeracy in the subjects they have day to day as well as in mathematics.

**[JS]:** Thanks Paul. So, trial one is about looking at teachers of some of our older students in secondary schools.

I guess that teachers of our younger children can't miss out on this opportunity. Sue, I'm wondering if you could tell me about the trial that you are leading.

**[SE]:** Thanks Jen. I'm the Project Lead for Mastering Number at Reception and Key Stage 1.

Here's a little bit about that programme. It's a professional development programme for Reception and Key Stage 1 teachers, and it also comes with some teaching materials. What we're trying to do is support teachers to use those materials with lots of ideas for teaching and having maths throughout their environment in Reception and Key Stage 1, so that children develop what we call good number sense. What is good number sense? It's about all sorts of things like subitising - being able to see small arrangements of number and quantities and knowing how many there are without counting. It's about understanding how numbers are composed, comparing quantities as well as understanding, counting and being really skilful at counting.

That's the aim of the programme: we're supporting teachers to develop good number sense for all of our children. So, although it's a programme for Reception and Key Stage 1 teachers, the EEF trial is just focusing on our Reception classes, partly because it's just so complex to try and look at different year groups.

We're just focusing on our teachers and our youngest pupils in school, in Reception classes. Why them? Well, I'm really passionate about this: we know early maths is so important. Children who don't reach those Early Learning Goals often go into Year 1 and although they can catch up, it is quite tricky.

It's challenging to do that, and we want children going into Year 1 as really confident mathematicians, children who know that they're mathematicians, they see number in the environment and they're confident talking about it. So it's really important, because we want children to achieve not just in Reception, but to have those really firm foundations going forwards.

It's about finding a way that we can support all of our children. We've talked a lot about disadvantaged and non-disadvantaged children. We want to level the playing field, and that's really what Mastering Number is about.

Jen was talking about that link between parental income and attainment, and we want to start tackling that really early on, so children are set up for success later on, which is why the focus is on Reception for this trial.

**[JT]:** Thanks, Sue. I work in comms, so I've had a little bit of experience in some of the challenges involved in the initial stages of the trial. But Jen, can you tell us a little bit more about some of the challenges involved?

**[JS]:** Yes Julia.

Everyone in the NCETM is very new to working with the EEF: we're all learning about the right way to go about these trials and the expectations that are placed on us and the hubs and the schools that we're going to be working with. It's nice that we're all learning together, and I'm hugely privileged to be working with such a great set of colleagues who are really running with this.

There are a few challenges that we are working towards. I think the one that plays on our mind the most is the challenges around recruiting schools to the trial. We design and run our programmes because we believe that they're really good things for schools to be involved in, and that we are making a positive difference to children.

We want all schools who want to work with us to get the opportunity to do that. The nature of a randomised controlled trial is that we are comparing two groups of schools over an academic year. We are comparing the attainment and the impact of the programme on an intervention group, a group of schools that receive the activity that get involved in the programme against that of a control group. A group that signs up who really want to work with us but do not yet get the intervention this year, will (subject to funding) be placed on a waiting list for the following year.

Schools will get an incentive for signing up for the trial, knowing that they might be in a control group, but really no school wants to be in a control group. They want to get stuck in there straight away, and they want to come and work with us, so telling schools that they're going to have to wait a year and that they're going to be part of that control group is really tricky.

But the control-group schools are just as important, as an RCT cannot run without them. As you can imagine administration is complicated, and this is where we're learning a lot. We've decided to go in with both feet and run two trials in the same academic year, working with two sets of teams from the EEF and two sets of evaluators.

As you can imagine, trying to make the experience for the hubs and for the schools as smooth and as even as possible is really tricky and we're working really hard in doing that. As part of learning about how to do a trial we're finding we need to be an expert in everything.

I have learned an awful lot in a very short space of time about grant agreement, about finances, thinking about research questions, looking at statistics, marketing... the list goes on, and I certainly don't feel that I'm an expert in everything yet. Being involved in a trial definitely is going to put extra pressure on programme teams.

Anybody running Maths Hubs activity wants to do absolutely the best job they can for the schools. There is going to be extra pressure on our Work Group Leads and our Cohort Leads to lead their programmes with fidelity, really sticking to the guidelines and the resources that are prepared, so that the experience of all schools and all teachers on the trial is equivalent across the country.

Finally, we weren't given any additional personnel resource to do this: we're really having to fit all of this in with our day job, so colleagues are working extremely hard to make this trial a success and to fit it in with all the work that we're already doing.

It's exciting! Learning new things is great, but it also does mean that it comes with additional pressures.

**[JT]:** Paul, what are the challenges for your programme?

**[PR]:** I would echo everything that Jen has said. With a few additional challenges that are specific to this particular programme for the non-specialists. One is that non-specialist teachers have different reasons for teaching mathematics. Some have requested to teach mathematics and have made it as a career change or a career move. I've worked with many non-specialist teachers who have made that choice, and some are even in leadership positions in the mathematics departments, but in other cases, teachers find themselves being directed to teach mathematics, due to, for example, a personnel or staffing change within the department suddenly, and the school has found someone else for the department who can teach some lessons.

Non-specialists have different reasons for being in a mathematics department and have different needs, and that will come with additional challenges when it comes to evaluating the impact of the programme on those different needs and those different non-specialist teachers. The nature of the trial also will be looking at impact on students.

In order to evaluate the impact on students, a particular year group will be the focus of the trial, which will be Year 8 student. That means that teachers normally don't necessarily need to teach a particular year group to be part of the programme, but to be part of the trial they need to teach a Year 8 class so that they can part of the evaluation.

We've found in the past that many non-specialists teach Year 8, and they tend to have that on the timetable anyway. But this time, for the trial, it would need to be on there. There are quite a few layers between the programme and the impact on students as well. For example, the Cohort Leads don't necessarily have a direct impact on students, they have an impact on the teachers, on the non-specialists, and it's the non-specialists then who have an impact on the pupils. So the impact of the programme has those layers in between.

And sometimes those non-specialists don't teach the class in its entirety: they might share that class with another teacher, for example, or they may have picked up the class part-way through the year, and other factors may play into impact on those Year 8 students as well. Another thing to bear in mind is that like with many well-designed PD programmes, the focus is not on having an immediate impact or changing everything about that teacher straight away.

The focus of the programme is on sustained teacher development over time, and the programme runs over at least two terms, but the aim is that the impact will gradually improve over time as the teacher builds up their skills and knowledge throughout the programme. So there can be a delay in measuring impact on students between them receiving the programme or engaging with the programme, and the impact being seen among the students they teach.

With that in mind, this particular evaluation, as well as measuring the impact on students, will also be looking at other outcomes, such as how the programme affects the teacher's own confidence and the teacher's own identity as a maths teacher, how the head of the department views the progress of the non-specialist teacher, and how the attitudes of the students maybe change in response to the non-specialist teacher.

Sheffield Hallam University will be running the evaluation for this programme: they'll be running some case studies where they'll be talking to different people such as a non-specialist, such as the Cohort Leads and also the department heads, and to student as well, for some of the non-specialists, to get a bit of a sense of what the secondary outcomes are and how the programme is impacting on the teacher as well as on the students.

**[JT]:** Thanks Paul. That was quite complicated: I didn't realise some of those issues that we're facing your programme.

Sue, how about you? What are the challenges for Mastering Number?

**[SE]:** Thanks, Julia. I think I'd start by echoing really what Paul said about that potential delay in the impact of professional development on a teacher, and that delay in terms of the impact on the pupils in terms of pupil outcomes.

That is one of the challenges if we're looking at that headline figure of the number of months of extra progress that a pupil has made, that might not be seen till later on. So, as Paul said, there's going to be some secondary research questions that start to tease out that delayed impact on pupils.

But in terms of that primary question, the number of months of progress that pupils make, it's really, really complex to measure that. Anybody who's worked in Reception or with younger children knows that it's hard to assess children's mathematical understanding. You don't tend to see it in a snapshot of 10 minutes or even half an hour.

It's something that we see over time: assessing that development in children's mathematical understanding is really challenging to do. We do need to find a way to try and do that, and together with the evaluation team, we've been looking to try and find an assessment that's validated that can give us a standardised score and start to try and assess some of the maths content that we are looking at in Mastering Number.

So that's certainly been a challenge. What I'm also aware of as the Project Lead is that what we are looking at for children in Mastering Number is that it's not just about that maths knowledge and skill that they develop over the Reception year, but it's also about their attitudes to mathematics, their confidence, their willingness to talk about their ideas, and their real engagement with maths.

Generally, that's going to set them up for success later on. So in Mastering Number, we're almost as much about developing those attitudes and dispositions as we are about learning the maths, and that's going to be harder for us to measure. Really, it's not going to be reflected necessarily in that primary research question.

We hope that when people read the full report, they start to see some of the more evaluative comments that teachers are making about their pupils and their attitudes, and hopefully that will come through. But as I say, educational research is really complex.

Paul said that earlier, and I think - particularly with our youngest children - it's certainly not an easy thing to do.

**[JT]:** Thank you, Sue. Leaving the negativity behind a little bit and focusing perhaps on our hopes for what we're going to discover from these trials, Jen, what are your hopes from the trials?

**[JS]:** Thanks Julia. Well, I guess, we would all love to see a positive pupil outcome in the way that both our evaluators decide to measure.

Both Sue and Paul have, have talked about the tools that they're going to be using and how crude a measure essentially the primary outcome measure is, and that's inherent in a randomised control trial. We would all massively celebrate a really positive result for those trials.

Beyond that, we'd like to see other positive pupil outcomes. We'd really like to see those secondary research questions and those secondary outcome measures, positive things, changes in our teachers' subject knowledge and practice, and changes in pupil attitudes. Improvements in pupils really using mathematical language and feeling empowered to do their mathematics.

We really hope that both trials and reports will show those things. We've planned all our programmes using the latest research. So we believe we'll see an impact and that's what we would really like to see, however that is reported. Beyond that, getting some positive numbers and some kind of reassurance that we are doing the right stuff.



It'll be really useful to see all of that rich data that can be used to inform continual development of the programme. We have a lot of internal evaluation, but getting some expert external evaluation that we can read and digest, will help our programmes get even better in the future.

We've never been involved before in an EEF trial: they're really prestigious and there will be some publicity and some conversations generated by the trial and its reporting, so we'd really like to be able to use this to secure future support and future funding, and celebrate the hard work of the NCETM and the Maths Hubs Programme that's been going on for over a decade now.

As part of that we'd like to be really transparent in what we do, how we do it, and how successful we are, and perhaps address some of those voices that have suggested there should have been an external evaluation earlier. We've worked really hard to secure one, and we want to address any voices that suggest that we are not transparent in what we do and report our impact.

What I find this quite interesting is that if we observe a programme or if we want to measure it, or if we want to pay real attention to a particular programme or a particular activity, that helps everybody involved in the programme put in as much effort as they can, then that makes the programme even better, just through that extra attention and that extra effort; that's called the Hawthorne Effect. And I'm very confident that there'll be some renewed vigour and enthusiasm for both the projects involved in the trial and they really will emerge as being even better and as good as they can be for pupils and teachers in the future.

**[JT]:** Thanks, Jen. I think that's true. I've never done as much communications work this year as I have for your two programmes, so it's fantastic. Paul, how about you? What are your hopes for the trials?

**[PR]:** I think my hopes for the programme is that it does have a positive effect on teacher identity.

I hope we see that through the results of the trial as well, and that the teachers who engage in the programme continue to teach mathematics in the future and feel positive about teaching mathematics as well. Also, I hope it supports them to teach any mathematical elements that are in their own subject, even though it's not necessarily part of the evaluation.

I very much hope it contributes towards that as well. I hope that having a national trial that focuses on the development of non-specialist maths teachers raises the status of the benefits that non-specialist math teachers can bring to a mathematics department, because they can bring a lot of value and enhance that department in many ways. On one hand it could be by bringing their own context and experiences from their own subjects to a maths department. I often found that, when I was working in a maths department, we were sometimes crying out for context, for ways to apply mathematics, and by having someone who teaches in another subject that uses mathematics, they can bring that context and expertise with them.

So, they bring an awful lot of value. But also, the programme itself is steeped in the essence of teaching for mastery, and many of the ideas, tasks, and pedagogical strategies that are promoted through the programme are aligned with the principles of teaching for mastery. My hope is that a non-specialist teacher engaged with the programme feels confident to then share those ideas with their colleagues, the maths colleagues in the department, and contribute towards that school's own journey towards teacher for mastery.

A school does not necessarily need to be already engaged with teaching for mastery in order to send one of their teachers on the non-specialist SKTM programme, but it may even help a school in their first steps towards that journey as well. I hope it brings really valuable information that speaks more generally about how we as Maths Hubs, but also as schools in general, can support non-specialist teachers in the future.

It'll help us develop the programme so that we can ensure it's serving non-specialist teachers and support them better in future. But the report itself, anyone can read who's not part of the programme, and it may have some information that's valuable for school leaders in how to support non-specialists as well, programme or no programme.

**[JT]:** Fantastic. Thanks Paul. And Sue, how about you? What are your hopes for the trials for Mastering Number?

**[SE]:** Thanks Julia. I think I'd start by again echoing some of the things that Paul said about wanting teachers to really love teaching maths. I know from my experience, that teaching young children maths is an absolute joyous experience.

And the more I was engaged in professional development, the more enthusiastic I got. And of course, I had greater impact as I was involved in PD myself. So, I do want Reception teachers to come to love teaching maths, to be real enthusiasts and passionate about it, and I really want also the status of early maths to be raised.

As I've said earlier in the podcast, it's so crucial that we give children that firm foundation in maths, and I think people are starting to recognise that, so I think the fact that there is investment in this research for early maths is really important and is going to have a positive impact on how people view early maths.

I suppose another real hope that I've got - again, thinking about our children who aren't so advantaged, who've not had as many experiences of number and maths generally at home. Those are the children that we're starting to see, and our teachers tell us that Mastering Number has a significantly greater impact on those children.

Again, it's about levelling the playing field and that equitable approach to maths learning. And I do hope that those secondary research questions start to tease out that there is that positive impact on those children who maybe previously wouldn't have achieved those Early Learning Goals.

The recent [TIMSS data](#) tells us that higher-attaining children do well, we're already doing well to develop the mathematical understanding of children who come to school; they've had really positive experiences of maths at home, but we haven't previously been doing so well in terms of the children that come to school with fewer experiences, and I think we've got an opportunity here to show that we can do something about this, and we want to close that attainment gap so that all of our children have a really deep understanding of the mathematics right from the very beginning, and so they go on to be successful in mathematics later on. So, I think it's about that focus on early maths, which is so important.

Let's upskill our Reception teachers and hopefully see that impact from the evaluation, so that we can carry on doing that good work going forward. I think also as a Project Lead - Paul's talked about how we want to learn from this, we never stand still in the NCETM.

We're always looking at evaluation data, asking what does it tell us about our programmes? How can we improve things even further? So, for us, this investment is going to support us in the work we are doing with all of our projects.

**[JT]:** Thanks, Sue. So, you want to make people like Paul's job easier then basically?

**[SE]:** Absolutely. I absolutely do. That's what we're working on: Paul, watch this space!

**[JT]:** Fantastic. Well, thank you so much all of you and we will include details of how to get involved in those programmes and any of the information that was mentioned will be posted in the show notes.



But thank you all for joining me today and thank you for listening. If you'd like to find out more about the EEF trials or about the two programmes discussed in this episode, we'll post links in the show notes, which will take you through to the programme pages where there's a wealth of information, including some FAQs for schools, and to speak directly to your local Maths Hub you can find your hub on the NCETM website, and we'll also post that link in the show notes too. I also have a favour to ask: if you'd like to support this podcast and the work of the NCETM, to make sure more people know about the fully-funded professional development available from Maths Hubs, subscribing to the podcast really helps us to promote our work and what's available more widely, and if you have the time to leave us a positive review, even better. Finally, don't forget, you can follow us on social media and subscribe to receive our monthly newsletter by email. To be the first to get the latest news features, explainer articles and videos, case studies and more, just visit [ncetm.org.uk](https://www.ncetm.org.uk) to subscribe.