The NCETM Podcast Episode 72

Secondary Mastery Specialists

Hello, I'm Beth Goodliff [BG]. I'm the NCETM Senior Comms Manager and I'm here with another podcast episode. This time it's for our secondary maths teaching colleagues and leaders in secondary schools. I'm talking today to Paula Kelly [PK] and Tom Lumley [TL], who both teach maths at secondary schools in Yorkshire, and have other roles. We're focusing particularly on how and why schools that already have successful maths departments can and should adopt teaching for mastery approaches. It can be a bit scary to make changes if things are going well, but Tom and Paula can both talk about how and why becoming Mastery Specialists and adopting mastery department-wide has enhanced their departments' huge success. So Paula, if you'd like to go first and introduce yourself to our listeners.

PK: Hi, I currently work at a secondary school in Yorkshire. It's a really high-performing Outstanding school. I'm there four days a week and then one day a week, I work on the maths PGCE course at the university.

BG: Thank you. And Tom, what about you?

TL: I teach most of my time at South Hunsley School in East Yorkshire, just outside Brough. I also run the secondary side of our SCITT programme, and I do quite a lot of work leading Work Groups for the NCETM and Maths Hubs. Like Paula, I'm also a Secondary Mastery Specialist and I'm currently going through the School Development Lead Programme.

BG: Fantastic. So you're both now experienced teachers familiar with the work of Maths Hubs, and you've been teaching in your schools for a number of years. When you decided to become a Mastery Specialist, how did that come about? Tell us a little bit about your journey.

PK: Part of my role at school is working with our feeder primary schools and the transition. More and more, the primary schools are so far on with their mastery work and things like bar modelling. I just thought Year 7s come to us, and myself and the people in our department wouldn't be that confident with that approach, and I felt we're being left behind with all this. So I just thought if I can get ahead of this - that's part of the NCETM programme, where you have chance to try it yourself, then try it with your department - it just seemed a really good opportunity to get some really good-quality subject-specific CPD, so that was the impetus behind it.

BG: And what would you say have been the benefits? First of all to you as an individual and to you as a classroom practitioner.

PK: Got loads of things; seeing not only a new way of teaching, but how to adapt what you're doing already, and it just made me think about how I was teaching things. So things like when you're frustrated that students are awful with their fraction arithmetic. Of course they are because they see it in little silos. And then I did some of the mastery training and just seeing someone looking at area and labelling side lengths with integer values, decimals and then fractions.

I don't know why - it blew my mind, I thought, why am I not doing this? And it made me excited about teaching: it's having some really good-quality CPD. It gave me the opportunity to think about what I'm really keen to go back and try in the classroom.

BG: And obviously you were hugely enthusiastic about it yourself when you were in the early stages of becoming a Mastery Specialist and part of that was introducing it to your department.

Did you experience the same enthusiasm? Was there any anxiety about what was perceived as making changes to something that was already successful? How did that work rolling it out across the department?

PK: I think it's one of those things I'm quite apprehensive about, so I'm really happy to develop myself and then trying to work with the department or even with other schools is quite intimidating, but I think because I

experienced for myself the success of it and how much more interest it gave me in my subject teaching, I was able to convey that.

And as well we had the approach of us as a department: we are doing really well, things are really good, it's not a criticism.

It's not changing everything. It's a development of what we're doing.

And because we did it in a collaborative way, we tried things out, we were quite open and said 'I could be better at this' or 'I found this useful and this difficult.'

I think we had a good atmosphere in that it wasn't 'What you're doing is wrong, change everything.' It's very much kind of collaboratively, 'Can we develop this? Are you interested in it?' So we're working together on it and being quite open about what things are more challenging. That was really useful.

BG: And was that a similar experience for you, Tom? Was it something as an experienced teacher that you thought 'Great this will really help kind of refresh my practice', and did you experience similar kind of activity with your department when you were encouraging them to get on board with their ideas too?

TL: Yeah, yeah, to a very large extent, I would agree. But when I first joined the department here, there was a really, really inspirational teacher who was really already immersed in maths conferences with the ATM, the Mathematical Association, she was really at the cutting edge.

She wasn't the head of department, she was just a really experienced teacher, but she'd already done a lot of work with the department around bar modelling, and this was really quite early on - I'm talking around 2011, 2012, 2013, which is quite in advance of other people. So I found that to an extent that inspired me to want to find out more. When I started this role, the teaching school that is affiliated to our school had contact with Maths Hubs, and I started doing work for them, and then by getting to know the Maths Hub, they said do you want to train to be Mastery Specialist then.

And I thought, well, this is an intersection of a Venn diagram I'd really like to be quite a big part of really, so I leapt at the chance for that.

In terms of apprehension, I think a bit like Paula I initially - selfishly - thought this is going to be great for me. I will really enjoy immersing myself in this and reflecting on my practice and I genuinely did. I thought it was transformational: I've got many similar stories to Paula where you just have those light-bulb moments - you go 'Wow, this is amazing', but then you realise the effect it's having on your students, and your students have that deeper, more profound understanding as well.

I definitely also shared Paula's apprehension about, though, 'Oh, how's this going to go? When I start suggesting it to other people?' Because, you know, as a profession, maths teachers can be a little bit prickly around 'But I already know that, you're telling me I'm doing it wrong.'

I've encountered very, very little of that. I have to say that generally people welcome the opportunity to just have a discussion, and I think we are very aware that we have a way of doing it, but most teachers would never be so arrogant to say 'And my way is the best way' because nobody knows all of the ways. How can you know if yours is the best way?

So I find that that opportunity to have those discussions around different approaches and different ways of doing it and all the different aspects of teaching for mastery, I think has been really, really productive and has been genuinely, really, really enjoyable to have those discussions, to be afforded that time to have the discussions with colleagues has been a genuine privilege.

BG: And what would you say would be maybe two or three of the changes that have taken place in your department so far as a result of adopting mastery?

TL: I think as a result of following on from my predecessor's work - she wasn't a Mastery Specialist but was immersed in that - we've now got bar modelling approaches embedded into our work and we're particularly gratified to see, for example, on the AQA GCSE exam mark schemes how that's now recognised as a viable method for solving a lot of proportional reasoning type questions.

So definitely use of bar modelling in a wider range of contexts: that includes percentage bars, percentages, fractions, decimals, ratio or proportion, and it's now the expected way that we teach it.

Another really big approach is in the wider trust where I've worked. We've had some schools who have embraced it much more than others, but the use of algebra tiles or number tiles, positive-negative number tiles as a consistent approach to the teaching of directed numbers.

So that's been really profound to the point where some of the schools in our trust now have sets of algebra tiles in every classroom to afford that. And that's as a direct result of the mastery programme.

PK: I was just thinking as you were talking. I like the idea of having those directed numbers through counters and the idea of zero pairs.

It's so nice when you have more things - we're talking about expanding brackets and say you have $(x + 5)^2$ and students want to write $x^2 + 25$ and you want to scream.

I don't know how to be clearer about this, but actually you can show it with algebra tiles - it makes so much sense and that links to their work.

So grid multiplication and all these different things that make so much sense when you've been given some support on how to teach things for a bit more understanding because even things we would talk about, say polygons, and previously I would have said ‘Oh, what's a polygon? ‘Oh it's a shape with any number of sides.’ Whereas now you talk about ‘Oh, it's going to have straight sides’ and they show you what it is and what it isn’t.

And all those different conversations that without this kind of extra support, I wouldn't have been able to have with students.

You can see that extra depth of understanding students have got – they know there are going to be straight sides, it can't be curved. It's got to be closed. They can tell you what it isn’t.

And that's been so fantastic and even like conversations about the mean for example, you'd have loads of sets of numbers - ‘find the mean these sets of numbers.’

That's fine, whereas now we talk about all the numbers have doubled. What's happened to the mean if I put this number in? What effect does it have on the mean? So there’s a lot richer understanding in lessons.

BG: And you've obviously had those lightbulb moments, Paula and Tom as well. When it's come to sharing that kind of information with your department, has that been through formal department meetings, or through conversations in shared PPA time? How have you both gone about rolling out that kind of information and that training and support to your department?

PK: I think everyone would have their own approach to it, but I think often the barrier to do this is time and everyone's so tight for time, no-one has any time.

So because we had some of the funding to take part in this, we were able to say ‘Would you mind having a twilight department meeting?’

And people are obviously reluctant, everyone’s busy, but they were able to say you can claim back this hour, with this funding, and do it more flexibly and that way you have got the time to take part in this, and that was really useful.

And I think rather than saying like ‘We're going to start teaching directed number using these counters’, I think by starting with ‘This is one approach, what you notice about it?’ and everyone having an open conversation. People are engaged in that and want to go and try it out and we tried to make sure we linked what we're looking at to what's coming up in our scheme, so it felt like we're not just looking at an arbitrary topic.

We're looking at ‘You’re teaching this next week, do you want to try it this way?’ And then we'll come back and feed back, so it's a properly productive use of time, but really interesting having that time together to talk about how they teach maths because you never get that time.

BG: So it's worth that investment of people's time because the benefits then for them will be seen in their lessons and with the students in front of them. And what about for you, Tom?

TL: I'm a year behind: I was trained a year after Paula. So my year of working with my department fell in the lockdown. That presented slightly different challenges because we weren't actually in school for a lot of it.

But what I found was that the colleagues I was working with were really keen to have those conversations. So we were on Teams and checking in with each other talking about different ways. But what was actually quite nice was that when I was teaching a lesson, and even when I was teaching remotely, I was making use of my visualiser and I had algebra tiles underneath it, and I had MathsBot for different representations, and I was bar modelling the heck out of everything on PowerPoint and whatever else I could get my hands on.

But because it was done through Teams, which is what our school was using, we could invite those teachers to come and watch those lessons. They could effectively be a student. In those lessons they got practical experience, and actually in many ways it was easier to arrange peer observations than it would have been if it had been in school. So although it wasn't great not being able to actually get together round the table, which I still think is something that you can't easily replicate, there were advantages to it.

And then, of course, once I've created something, whether it's a resource or a Smartboard or a PowerPoint or whatever else, it was then just sharing it around, and a bit like Paula I think that the key thing to engaging the department is to make it directly relevant.

You know, it's one thing to say, ‘OK, I'll pick this random topic. I'm going to talk about it.’ It's quite another thing to say ‘Right, we're all going be teaching this in the next two or three weeks. Here's a resource. Here's an approach. How about thinking about using this? And, hey presto, I've done some of your planning for you.’ You're then pushing an open door, I think.

BG: Definitely. And obviously you've both experienced huge successes in your departments. Have there been any moments of resistance or challenge or where you’ve thought ‘Oh, we're going to have to go back to the drawing board here. Has there been any barrier that you've had to overcome and how have you done this?

PK: I think time is the main thing, but also I think it's people's confidence because like you say people are experienced, they're great teachers, they know what they’re doing, they're doing a great job. I think questioning that a little bit and just questioning what you do yourself, is difficult, and I think it's how you approach things as you're working together as a department, not the head of the department saying ‘I'm great at this, everyone copy me.’ It’s not like that at all.

I think just having that chance to do some collaborative planning – ‘go away and try it and then come back and feed back what's going well and what hasn't got well’ – and just have that atmosphere where you can be quite open and say things haven't gone well.

So we were looking at fluency, for example and we had all these different ways of finding an amount, it's just brilliant. There were so many different ways - it was really, really good and then tried it once in a lesson and it was really awful, really fell flat on its face. I think having that conversation that actually we were trying to do too much too soon, I'm going to tweak it and try again and have a longer process rather than it's all success, the complete silver bullet. Just having that kind of openness in the department and to try something that’s not always going to go really well and that's fine.

BG: What about you, Tom? Were there any moments of challenge that you had to overcome?

TL: Very few in all honesty, I mean the two that spring to mind: one is when I was doing some support work in another school and there was definitely some raised hackles 'Are you trying to tell me how to do my job? Are you saying what I'm currently doing isn't good enough? But my results are OK. So why change anything?' And I think that's where, as a Mastery Specialist, your emotional intelligence comes in where you just need to say 'No, I'm not saying that.' And you're just getting them on-side and you're just presenting an alternative approach, but possibly pointing out the benefits of yours, as opposed to pointing out the weaknesses of their current approach, can be really beneficial. But that's been very, very rare, very few and far between. I have to say that ultimately that person became one of our strongest advocates and was really, really won over. But there's sometimes that initial hurdle to overcome, particularly people who have been teaching for quite a long time can be quite set in their ways and therefore potentially resistant to change.

But when you have conversations, the conversations are not 'I'm trying to tell you how to do your job. Let's just have a chat about why? Why do we do things in a certain way?' And 'Are there other ways and let's compare them? What are the advantages and disadvantages?'

And I think the other experience I had which came to mind very much echoes what Paula said, which I would probably categorise best as possibly over-enthusiasm by participants, where they think 'This is marvellous, this is wonderful. I'm going to do all of this', and they change everything about the teaching, they fully embrace mastery.

But they're very much running before they can walk, I think, and then some things do begin to fall down.

And also I think we need to be honest about this. This is not going to be transformational overnight. This is not, as Paula said, a silver bullet. But what it will do, it will have a lasting long-term effect on greater retention, a deeper understanding and greater inter-connectedness of mathematical concepts in the minds of our learners.

That's something that you will notice over time, but it's not something you're going to see by the end of the week or early next week.

And also it can be quite difficult to quantify: you will know it when you've been in a school where it's been embedded because the students are more confident they have that more interconnected set of knowledge and understanding.

They're more willing to attempt to get started on unfamiliar situations because they've got that fluency, and that portability of knowledge into different contexts.

But I think baby steps: that coherence is absolutely an important step of it where we are doing it little by little in a sensible, coherent way, as opposed to trying to do everything all at once because that, although I love the enthusiasm, I think sometimes we need to just put the brakes on just a little bit.

BG: So there are clearly benefits to you as individuals, to your departments and of course, from what you've both been saying, to the students in front of you. A headteacher might say, 'Well, why would I want one of my really great maths teachers to be out of school to then be going out to other departments? I need them in front of my students here.' What argument would you put to that? What would you say the advantages are to your school of being a local leader of maths education and a Mastery Specialist? Go on, Tom.

TL: I actually have this conversation with my headteacher and the CEO of our Academy Trust, who oversees quite a number of secondaries. He says 'I would rather have you in school 95% of the time, than have somebody who is really stuck in their ways and resistant to change and teaching how maths was taught 30 years ago, 100% of the time.

'And actually, if you being out 5% of the time means you can come and cascade that knowledge and improve the practice of everybody else in the school, then why wouldn't I want to do that?' He said 'The cost to us is very, very small, your classes more than make up for the time that you're going to be out because of the extra knowledge you're getting through the training, the experiences you're getting through the NCETM networks, the

Maths Hubs networks, the LLME meetings. So why wouldn't I want to do that? I would be a fool if I didn't do that,' and that's exactly the conversation I have with my CEO.

It sounds so obvious when you put it like that doesn't it!

BG: What about for you, Paula? Is it similar support from your leaders in your school?

PK: Yeah, thankfully they're really supportive and I know that isn't the case everywhere and it's not always been the case for the advocates I've worked with – but it is the argument that you're developing that culture because you're in your own department developing that culture of continual development. You're still driving forward that change and improvement. You can't get someone external to do that for you.

And also, of course, you've developed. I think this is quite a strong argument for trying to retain really high-quality staff. If you've got staff who are just perhaps not very inspired because they're doing the same job every day you get a bit switched off, whereas if you're enabling someone to take part in really high-quality CPD, they're a lot happier. They're passing it on their department, the department gets a lot happier.

And that's really useful, but also, thinking about any kind of middle leadership opportunities, they're so rare in terms of maths - lots of big departments, there's one second-in-department, it's quite hard to get responsibility. So if you have people that are looking for their next steps and responsibility, it's a good thing to get involved with and an opportunity for people to try and lead some change in their own department. So you're working with some advocates and they're looking to be able to show that they've had an impact on changes in a department, then becoming Mastery Advocates is really, really useful for them as well.

BG: Indeed. Thank you. It's been an absolute pleasure to hear from both of you today about your own journeys in mastery and the success in your schools and to hear about the work that you're doing with other schools and the benefits to your school of having you there as a local leader of maths education.

If people are interested in finding out about teaching for mastery in their secondary school, in their maths department, go onto the NCETM website and search secondary mastery Development Work Groups, or get in touch with your local Maths Hub.

There are still spaces available in Development Work Groups for secondary schools next year and Maths Hubs are really keen to hear from secondary schools, or to welcome back secondary schools who've been part of the programme in the past, and to offer these opportunities to all secondary schools teaching maths in England. Thank you both very, very much and I hope everybody has enjoyed listening. Thank you.