

Talking the talk...but walking the walk? How do non-specialist mathematics teachers come to see themselves as mathematics teacher

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In this TAS 2014 presentation we reported on a research project which was set up to investigate how teachers on the in-service programmes offered by our institution developed as teachers of mathematics. We orientated our research around a central research query: *How do already qualified, non-specialist mathematics teachers come to see themselves as mathematics teachers?*

Background

To address the shortage of mathematics teachers in England, UK,

serving teachers, qualified in subjects other than mathematics yet teaching secondary mathematics (whom we refer to as *non-specialist mathematics teachers*), were eligible to participate in SKE (Subject Knowledge Enhancement) courses commissioned and funded by the Teacher Development Agency (2011). Various providers in different regions of England offered these courses and had the freedom to design their own curriculum. The curriculum designed by the mathematics education team at the Institute of Education, University of London deliberately avoided mathematics National Curriculum classifications and arranged the SKE curriculum to cover four broad mathematical content themes: Infinities, Uncertainties, Structures and Spaces. Mathematics pedagogical knowledge was taught by example, discussion and by setting school-based tasks that were supervised by the school-based mentor.

The research project

We chose a purposive sample of five case study teachers each of whom had come via a different training route. The research took place alongside the course and was subordinate to the course. Data of the following types were collected as part of teaching: autobiographical data; a 'needs analysis' (of their mathematics subject knowledge and capacity to diagnose pupils' errors/misconceptions); collection of their: maths work; school-based work; mentor feedback; assignments; reflections; observations in university sessions. Some of the biographical details of the case study teachers are presented Table 1 below under their pseudonyms:

Table 1. Participants

	Jessie	Sara	William	Nas	Lech
ITT route	BA/QTS	PGCE	BEd	Teach First	EU QTS
Subject specialism	Primary (PE)	ICT	PE	Citizenship	PE
School phase training	Primary	Secondary	Secondary	Secondary	Secondary
While on the course taught some mathematics for ...	10 years	3 years/three hours per week	2 years/ one lesson a week	2 years/ one or two lessons a week	9 years/ teaches some maths

Theoretical framework

In our work with the non-specialist teachers, we found that while they were aware of the need to gain and improve their maths knowledge domains (both subject knowledge and pedagogical knowledge), the teachers were also preoccupied with whether and how they will be recognised as maths teachers by their colleagues, school or potential employing schools and maths departments. And so our conceptualisation of mathematical knowledge for teaching has changed and we began to view it as an aspect of teacher identity rather than a property of a teacher. The teachers were just as pre-occupied with imagining their new identity as they were with their SK and so we turned our attention to Etienne Wenger's communities of practice framework, which we used to analyse and interpret teachers' reifications, practice and participation in the learning of mathematics.

References

- Teacher Development Agency. 2011. Join the free Return to Teaching (RTT) Programme. <http://www.tda.gov.uk/teacher/returning-to-teaching/ske-for-returners.aspx> (accessed 3 December 2011)
- Wenger, E. 1998. *Communities of practice: Learning, meaning and identity*. New York: Cambridge.

Data analysis and some findings

We reported 'horizontally' across the cases studies and we presented our findings under themes that came from analysis of the data overall using the communities of practice lens. Analysis of data considers the participants' developing mathematics teacher identity in terms of 'engagement, imagination and alignment' (Wenger 1998), supported with excerpts from some of our case studies to illustrate how the participants negotiated their own trajectories of learning towards a new identity, that of mathematics teachers.

Conclusion

As the non-specialist mathematics teachers' confidence in their own mathematical ability increased, we noticed a change on how they talked about themselves as potential mathematics teachers. The teachers became preoccupied with whether and how they will be recognised as mathematics teachers by their colleagues on the course, current school or potential employing schools and mathematics departments.

In Wenger's terms, these teachers are newcomers to the maths teaching community and as such they must negotiate their own trajectories of learning to become maths teachers. These teachers negotiate their contribution to the practice of mathematics teaching community. They are aware of their limitations and instead of positioning themselves as outsiders (as they do not have a strong mathematical background), they focus their attention on the meanings that really matter to them: their struggle with mathematics gives them a special insight into understanding pupils' difficulties with mathematics and this privileged viewpoint offers them access to participating and contributing to the mathematics teaching profession. Experiencing the joy and satisfaction of doing maths, beginning to see connecting themes in maths and experiencing being a maths learner on the course positioned them on the trajectory of learning towards a new identity, that of mathematics teachers.