

# Mathematics teacher agency

Gill Adams, Sheffield Hallam University, ✉ [g.adams@shu.ac.uk](mailto:g.adams@shu.ac.uk)

Mark Boylan, Sheffield Hallam University

Anna Chronaki, University of Malmö and University of Thessaly

Herine Otieno, African Institute for Mathematical Sciences

Pete Wright, UCL Institute of Education

*Neoliberal policies dominate in many parts of the world, setting a frame within which education practices are frequently constrained. In mathematics, perhaps more than other subjects, these constraints seem to be more keenly felt, not least because of the economic value placed on mathematics expertise and the related effects of performativity and accountability. In this symposium we explore potential sources of support that may enable mathematics teachers to challenge orthodox practices, facilitate creative responses to and/or rejections of policy constraints as they negotiate agency over their practice and their learning.*

## Introduction and aims

Neoliberal discourses of mathematics practice and of teachers' professional learning are often framed in terms of quality, with teachers viewed as deficient, their skills, knowledge and practice in need of improvement. Responses to these perceived deficits include large-scale, cascade models of professional development, albeit with increasing attempts to incorporate knowledge of what makes for effective teacher learning experiences. Such responses can constrain opportunities for teacher agency and contribute to teacher dissatisfaction, as teachers experience a lack of autonomy over their learning and their work.

To counter these discourses, in this symposium we share examples of and perspectives on the achievement of mathematics teacher agency, exploring implications for teacher learning, foregrounding questions of equity. Our interest lies in the creative ways that individuals and groups of mathematics teachers resist predominantly neoliberal discourses, determining their own learning goals and how they are supported to do this. We reflect on our own efforts to support teachers to transform practice, the challenges this raises and how teachers respond.

## Exploring mathematics teacher agency

Agency is understood as a 'situated achievement' (Priestly et al. 2015, p. 29) – temporally embedded within a socio-cultural context. One approach to understanding agency focuses

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on three temporal dimensions, an ‘iterational element’, providing a stabilising influence from the past, a practical-evaluative element that focuses on an actor’s capacity for making reasoned decisions, and a projective element where creative possibilities for future are imagined (Emirbayer & Mische, 1998). Threading through these three dimensions, we identify a variety of *teacher roles and practices* (e.g., practitioner researcher, ‘champion’ teacher, ...), *modes of collectivity* (e.g., research group, collaboration, peer learning), engagement with *external stimuli and support* (e.g., texts, networks, researchers, teacher educators...) and *tools* (e.g., resource design, pedagogic experimentation, video stimulated reflection, social media).

## Symposium plan

Through sharing alternative perspectives and accounts of teachers’ agency over their practice the session aims to stimulate discussion on our roles (as teacher educators/researchers) in supporting teachers’ efforts towards transformative practices in mathematics. Each presentation will explore one or more of the themes of teachers’ roles and practice, collectivity, external resources and tools in relation to agency. Presentations will be followed by small group discussions, inviting participants to reflect on their experiences in relation to these questions:

- How are possibilities for mathematics teacher agency supported or constrained in different contexts? Which groups/individuals are included/excluded?
- What responsibilities do we have (as teacher educators/researchers) in relation to supporting teachers’ achievement of agency?
- What do we learn from teachers and students concerning ‘agency’?

*Introduction to the symposium and presenters (5 minutes)*

*Paper 1 Possibilities for mathematics teacher agency in England: Historical policy traces. Gill Adams & Mark Boylan (12 mins)*

In this paper, we explore the state’s changing role in shaping professional learning activities within the neo-liberal context, focussing on England. By examining ways that policy (and its absence) in relation to mathematics teacher learning influences broader socio-cultural conditions thereby offering shifting possibilities for teacher agency we outline the way that power relations, cultures and materialities operate across four time periods characterised by clear differences in policy and structures. These four are broadly: first, prior to the introduction of the National Curriculum (1970-1990); the second period from 1990 marked by national initiatives aimed at driving up standards in mathematics; the third centred on the introduction and early years of the National Centre for Excellence in Mathematics together with increased support for teacher led professional development and a fourth, marked by a reassertion of a central national agenda. We consider the roles and practices available to teachers in these times, drawing out possibilities for collaboration and examine how teachers (individually and collectively) interact with external influences.

*Paper 2 AIMS Teacher Training Program: Working WITH Teachers and not ON teachers. Herine Otieno (12 mins)*

In this paper, I reflect on the efforts I have made as a team lead for a Teacher Training Program for mathematics & science teachers in Rwanda, to transform a teacher training model originally shaped as a top-down cascade model to one which is largely hinged on teachers' individual and collective contributions. Citing specific examples, I reflect on the process of shifting the training program from using University lecturers as master trainers and a pre-defined, externally developed teacher training curriculum to promoting peer learning amongst teachers and drawing on individual teachers and teacher collectives referred to as champion teachers to organically identify key training content and interventions for improving quality of teaching & learning of mathematics in Rwanda secondary schools. Finally, drawing on observations and excerpts from two different threads of WhatsApp conversations with champion teachers and some of the participating teachers and employing the transformative professional learning framework (Jones & Charteris, 2017) I will explore the emerging 'impact' on the teachers' relationship with each other, teaching, and key stakeholders in their teaching 'environment'.

*Paper 3 Participatory action research (PAR): A critical model for transforming classroom practice through developing collective agency. Pete Wright (12 mins)*

PAR offers an alternative paradigm for research/ professional development in which teacher researchers (TRs) and academic researchers (ARs) collaborate in bringing about changes in classroom practice. Skovsmose and Borba (2004) outline a critical model of PAR which recognises the essential/ complementary roles played by both TRs (with their in-depth knowledge of the classroom situation) and ARs (with their expertise in research methods) in the research process. This model was adopted for the Teaching Maths for Social Justice (Wright, 2020) and Visible Maths Pedagogy (Wright, Carvalho, & Fejzo, 2020) research projects. Both projects involved the author as AR and sought to develop engaging and empowering practices in the mathematics classroom, a site that has historically proved highly resistant to change. The projects demonstrated how the mutual support and collective agency generated by a research group, or network of teachers, enables TRs to take risks and overcome constraints they face in developing their practice in line with a commitment to equity and social justice. The research groups provided opportunities for TRs to: engage with CME research literature; collaboratively plan, trial and evaluate classroom activities; design and implement their own data collection tools; and critique existing/new practices through video-stimulated reflection.

*Paper 4 Teachers' relational agency: Affective bodying with children, materials, concepts and difference. Anna Chronaki (12 mins)*

The purpose of this paper is to discuss teacher agency as a relational matter that grows through affective bodying with children, teachers, concepts and difference in the community revealing a process of minoritarian becoming(s) (Chronaki, 2019). It is based on the analysis

of recent experiences through collaborative work amongst children, teachers, student-teachers and researchers. In the project context, the author was involved in a process of creative design addressing mathematics in the context of ‘the commons’ of a specific community through radical pedagogic experimentations (i.e., playing and making mathematical games and crafts: spaces for coming together, global crises and local solidarity: debt vs money as common good and money, see <http://www.citizenship-and-mathematics.eu>). In a series of seminars and school-based work with participant teachers and children, these materials moved from the researcher’s desk out to the public space of school classrooms, communal areas, the streets or the kafeneion. Here, we aim to denote aspects concerning this transformative move and to discuss teachers’ agency as relational in multiple layers of research-creation with teachers, children and the community.

*Group discussion & plenary (25 minutes)*

## References

- Biesta, G., Priestley, M., & Robinson, S. (2016). *Teacher agency an ecological approach*. London: Bloomsbury Academic.
- Chronaki, A. (2019). Affective bodying of mathematics, children and difference: Choreographing ‘sad affects’ as affirmative politics in early mathematics teacher education. *ZDM Mathematics Education* 51, 319–330.
- Emirbayer, M., & Mische, A. (1998). What is agency? *The American Journal of Sociology*, 103(4), 962–1023.
- Marguerite Jones & Jennifer Charteris (2017) Transformative professional learning: An ecological approach to agency through critical reflection. *Reflective Practice*, 18(4), 496-513.
- Skovsmose, O., & Borba, M. (2004). Research methodology and critical mathematics education. In P. Valero, & R. Zevenbergen (Eds.), *Researching the socio-political dimensions of mathematics education* (pp. 207–226). Dordrecht: Kluwer.
- Wright, P. (2020). Transforming mathematics classroom practice through participatory action research. *Journal of Mathematics Teacher Education*. <https://doi.org/10.1007/s10857-019-09452-1>
- Wright, P., Carvalho, T., & Fejzo, A. (2020). Visible mathematics pedagogy: A model for transforming classroom practice. *Educational Action Research*. <https://doi.org/10.1080/09650792.2020.1850497>