

Exploring Mathematics Education in Various Countries

Interview with Alf Coles, Chair of the British Society for Research in Learning Mathematics

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General

Dear Alf, thank you for your willingness to participate in this interview. To start, could you tell us how the mathematics education research community is organised in your country?

We have a “Joint Mathematical Council” which brings together representatives of many professional and academic bodies concerned with mathematics and mathematics education in the UK. This body meets three times a year and will commission reports and engage with policy makers. Researchers are represented on this council through the British Society for Research in Learning Mathematics (BSRLM). I am the current Chair of BSRLM but am responding to these questions as an individual. For me, BSRLM is the key vehicle through which the research community is organised in the UK, although we have recognised that we have more work to do to extend our work across the whole UK.

I am of course biased, but I believe BSRLM is a precious organisation, cherished by researchers in this country and more widely. Its main activity is organising three, one day conferences a year. These are conferences where anyone can present their work and receive supportive but challenging feedback. One of BSRLM’s strengths is its diversity and inclusivity. We will always have a wide range of presentations, including teachers, PhD students, Professors and each will be treated in the same way – with respectful critique. During COVID, we moved to online conferences and, since then, we have retained one day conferences each year in this mode (the other two being face to face). The online conference takes place in March each year and one of the reasons members seem to like it, is the opportunity for researchers from around the world to attend and contribute. So, anyone from Germany is more than welcome to join and attend and get involved. You can find more details about BSRLM here: bsrlm.org.uk/167399-2/

BSRLM also owns the journal *Research in Mathematics Education*. This began as a journal linked to our conferences but has now become a significant international publication. And, finally, BSRLM contributes to the “British Congress of Mathematics Education” (BCME), which takes place every four years and is a little like a version of ICME, run just in the UK, bringing together researchers, teachers, teacher educators and more.

Research Focus and Methods

Are there specific themes or issues that are particularly in focus in mathematics education research in your country?

I do not claim to have an overview and so will comment on those themes and issues that have taken my attention. When I was a teacher in secondary school, I introduced “mixed attainment” grouping for students in years 7 and 8 (age 11–13) in mathematics and, maybe because of this, I have been very interested in on-going research into mixed attainment teaching, being carried out by the Institute of Education (2024). In the UK, teaching of mathematics has generally been “setted”, i.e., with children organised by prior attainment. You might well see children from the very start of school sitting on tables with peers who are judged to be of similar “ability”. And we know that once you are in a set with other low attaining students, it is hard to get out. There are moves, encouraged by government, to have more mixed grouping practices and this is something I see as important, in terms of tackling inequalities of educational outcomes. As a country, we know that students’ socio-economic background is a significant predictor of achievement. We also know from other countries that this need not be the case, and yet the problem has persisted through all attempts at change.



Foto: Nicola Turner

Alf Coles, Chair of BSLRM

On the theme of disadvantaged students, the University of Nottingham is just embarking on an ambitious longitudinal cohort study – to try to understand more about how to improve mathematics education for all students. I am on one of the advisory panels for this project, which is unique in my experience of mathematics education research, in its aim to follow students over seven years. You can find more details on the Website of Observatory for Mathematical Education (2024). I am excited by what we might learn.

And, to mention just one more theme, the University of Loughborough has an important “Centre for Mathematical Cognition” (2024), funded by a large government grant, which brings together mathematics educators and psychologists and cognitive scientists. One of their aims is to bring research results to schools and make research accessible, as well as linking with schools to discover their research priorities.

What challenges does the mathematics education research community in your country face?

University funding is in a parlous state, as a result of a freeze on student fees that has been in place for almost 10 years. University funding changed in 2012 to be largely paid for by individuals, with fees set at £9000 a year, for home students. These fees are paid via government loans that students pay back over a 30 or

40 year period, once they leave and their salary is over a threshold. The maximum fee that could be charged increased to £9250 in 2015 and has been stuck there ever since – it has become politically toxic to propose further rises. If you think about what has happened to University costs in that time, the result is a yearly squeeze on budgets – which many Universities try to offset by raising the proportion of international students. One knock on effect for researchers is that many are on temporary and precarious contracts.

How is collaboration between mathematics educators and teachers organized in your country to implement research findings into practice?

Recently our school inspectorate (Ofsted) wrote a “review of research” with the aim of relating what is known about good maths teaching to schools – with the implication they would be looking for the implementation of recommended practices when they visit schools. The review was roundly criticised, within the research community (e.g., see: Gilmore et al., 2021), for being more of a position paper – misrepresenting research results in order to push messages about the importance of knowledge and memorising procedures over any focus on understanding.

There are statements in the review pushing a narrow image of problem solving (limiting it to word problems), to take one example. And then, in a related document of advice to inspectors of schools, the review of research helps justify advice that, “demonstrating proof of ‘understanding’ will not guarantee that pupils learn useful facts, methods and strategies. Moments of understanding, no matter how powerful, are likely to be fleeting”. In other words, inspectors are not to be focused on what students do, or do not, appear to understand, but rather on facts, methods and strategies.

This sounds quite unbelievable to write for an international audience. I think the UK is a cautionary tale of how education research findings can become weaponised for political purposes.

International Perspectives and Collaborations

To what extent do international research trends and discussions influence mathematics education in your country?

Certainly, PISA and TIMSS are taken seriously in the media and by politicians. Politicians look at other country’s practices. We are in a time currently when there

has been a lot of focus on how we might adopt elements of mathematics teaching practices from East Asia.

Educational Policy and Practice

Are there any special programs or initiatives focused on teacher training or professional development in mathematics?

For the first time we now have a mandated curriculum for teacher education in England – including suggested reading lists. Every teacher education provider recently had to re-apply for accreditation to continue offering teacher education – showing how they would implement this new curriculum. I see the move as further politicisation and removal of professional autonomy of teacher educators. There is an attempt here to shape the messages given to new teachers, along the same kind of lines as the “review” of research mentioned above.

More positively, the government has funded a network of “Maths Hubs” in England (NCETM, 2024). These are based in schools and have responsibility for organising professional development across primary and secondary sectors. Some of the programmes they run are quite inspiring. For instance, there is a programme of training in Mastery teaching at primary school, which is providing many teachers with quality training and also supporting peer led development within and across schools. Hubs need to implement some national programmes of training but also develop local initiatives, responding to needs.

What particular challenges will educational policy in your country have to face in the coming years?

Along with Universities, there is a crisis in school funding. Schools have faced real terms cuts over many years now. For the last two years, pay deals have been given to teachers, which have only been part funded by increases from government – the rest having to come from existing budgets. This has led to staffing cuts and a general sense of there not being the resources needed to provide all students with what they need. We used to have a large workforce of “teaching assistants” in schools, supporting students with the greatest needs – many schools have had to cut these roles to balance their budgets. Any new policies will need to address this fundamental issue.

*How is teacher education structured in your country?
How is the school education system structured in your country?*

There are many routes to becoming a teacher – university courses but also courses run by schools. University courses tend to be 1 year post graduate degrees, in which $\frac{2}{3}$ of the year will be spent in a school. School based courses run along similar lines, but with more minimal University input.

Our schools are now largely run by private companies, called “Multi-Academy Trusts” (MATs). MATs have to follow the National Curriculum, but are free to set their own pay and conditions for teachers. The privatisation of education, at University and school level, has been a creeping reform over the last 20 years.

Future Perspectives

What trends or developments do you see as particularly promising or important for the future of mathematics education in your country?

I have personally been heartened by moves towards what I see as a “socio-ecological” turn, (or perspective, or movement) in mathematics education. This is a perspective taking seriously what is happening outside the classroom walls. I do see a lot of what happens in UK schools as essentially “business as usual” and I wonder if this is rational when, to quote a phrase from a friend, Liz de Freitas, there are boats on the streets of Nairobi. ICMI have commissioned a Study conference on “Mathematics Education and the Socio-Ecological” which I view as a sign of hope – see Coles & Le Roux (2024) if you would like to get involved. This conference will bring together work happening around the world and will, I am sure, make a strong case for curriculum reform, assessment reform, pedagogical reform.

What steps do you believe are necessary to further promote and improve research and practice in mathematics education in your country?

I believe strongly we need a de-politicised process for the development of the curriculum (and, with it, assessment and school inspection). I would like to see a permanent advisory council on education, with responsibility to research, plan and propose curriculum change and renewal. Change could then be rational, taking account of new research and able to respond to current global contexts, rather than being dictated by government ideologies.

Thank you, Alf, for taking the time to share your insights with us.

Literature

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