The Joint Mathematical Council of the United Kingdom

A Charitable Incorporated Organisation
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Registered Office: De Morgan House, 57-58 Russell Square, London, WC1B 4HS

Minutes of the General Meeting held at the Council for Voluntary Organisations at 11.00 am on Thursday 13 June 2024

Present

Officers

Chair	Andy Noyes
Deputy Chair	Noel-Ann Bradshaw
Secretary	Chris Chipperton
Treasurer	Fiona Curtis

Unattached Trustees

Elected Trustee	Beth Kelly

Representatives of Participating Bodies

Adults Learning Mathematics	Diane Dalby
Association of Mathematics Education Teachers	Fiona Curtis
Association of Teachers of Mathematics	Richard Perring (Deputy)
British Society for Research into Learning Mathematics	-
British Society for the History of Mathematics	June Barrow-Green
Edinburgh Mathematical Society	-
Heads of Departments of Mathematical Sciences	Mary McAlinden
Institute of Mathematics and its Applications	Paul Glaister
London Mathematical Society	Mary McAlinden
The Mathematical Association	Ems Lord
Mathematics in Education and Industry	-
National Association for Numeracy and Mathematics in Colleges	Andrew Davies
National Association of Mathematics Advisors	Ruth Trundley
National Numeracy	-
NRICH	Ems Lord
Operational Research Society	-
Royal Academy of Engineering	-
Royal Statistical Society	-
Scottish Mathematical Council	-
STEM Learning	Michal Anderson
United Kingdom Mathematics Trust	-
Wales Institute of Mathematical and Computational Sciences	Sofya Lyakhova

Co-opted Members

UK Representative to the International Commission on Mathematical Instruction	Paul Glaister
Social Media Lead	Richard Perring

Representatives of Observing Bodies

Department for Education [England]	-
Department of Education [Northern Ireland]	-
Education Scotland	-
National Centre for Excellence in the Teaching of Mathematics	Sue Madgwick
Office for Standards in Education	-
The Office of Qualifications and Examinations Regulation	-

The Royal Society	Sam Murphy (Deputy)
The Royal Society Advisory Committee on Mathematics Education	Anthony Tomei
Scottish Qualifications Authority	-
Welsh Government Education Department	Lian Crierie

Others in attendance

Oak National Academy	Ed Southall
University College London	Manolis Mavrikis
University of Birmingham	Michael Grove
Oak National Academy	Matt Gregory
Cabinet Office	Gareth Lomax

1 Introduction

1.1 **Welcome** The Chair welcomed those in attendance. This was the first in-person only meeting since 2020 and its effectiveness will be reviewed.

1.2 **Practical Arrangements** The Secretary went through the practical arrangements for the day including fire evacuation.

1.3 **Apologies for absence** Apologies for absence were received from:
Helen Madeley (ATM) – deputy: Richard Perring; Alf Coles (BSRLM); Paul Milner (National Numeracy); Chiara Carparelli (OR Society); Alan Walker (SMC); Zoe Nye (RSS); Alex Smith (DfE); Julie Harris (DoE); Sarah Old (Ofqual); Cath Boulton (Royal Society) – deputy: Sean Murphy; Georgina Holmes (SQA)

New members and deputies were welcomed to the meeting.

2 Minutes of the meeting held on 22 February 2024

2.1 **Approval of the minutes of the meeting on Thursday 22 February** The minutes were approved.

2.2 **Matters arising not elsewhere on the agenda**

4.2 The call for a stronger element in the DSIT consultation appears to have been heard.

5.7 Clarification on 'the report is being used in conversations with the Office for Students' was sought and given.

3 Reports from Trustees

3.1 **Chair** The Chair gave a verbal report. He had attended a Gates/XTX symposium with interesting conversations including AI in education, an XTX funded 'Transforming Maths' summit at which there was a good involvement and engagement allowing lots of connections with Government, and an Axiom sponsored dinner with a number of peers who were ex-secretaries of state/ministers.

Thanks were expressed to Paul Glaister who had represented JMC at an Education Select Committee meeting on teacher recruitment, training and retention. Their report, which highlights a lot of challenges, was published on 8 May; JMC is cited in para. 67.

Promoting Pure Maths has become the Campaign for Mathematical Sciences. There will be a launch and a dummy website is in place.

The Chair and Deputy Chair have met with Lynne McClure and Nigel Campbell last week. This was part of an ongoing conversation about the JMC's position with the Academy for Mathematical Sciences.

JMC didn't respond to the ABS consultation, but many member organisations did individually.

The Chair had attended a number of ACME meetings.

3.3 **Secretary** The secretary report was noted.

3.4 **Treasurer** The Treasurer's report was noted.

It was confirmed that funds were buoyant with BCME money still in the account. Efforts are being made to open a new account for the BCME money, but this is proving a slow process.

It was agreed that consideration should be given to spending some of the funds on additional projects. The Chair stated that the two main forms of project are working groups and commissioned syntheses of

research. It was remarked that JMC reports are very useful and have authority. AI in mathematics education was thought to be a good area to pursue and a small working group sought to frame a small piece of work – **Action: Secretary**.

It was questioned whether grant making would be a possible use. The Secretary is to check the constitution – **Action: Secretary**.

4 Elections

4.1 **Chair** Professor Noel-Ann Bradshaw was elected unopposed to serve as Chair from the end of the AGM on 7 November 2024 until the end of the November 2027 AGM.

4.2 **Change to the constitution** It was resolved to amend the constitution with a new clause 12.5.7 *Where a Deputy Chair is elected Chair, Council may resolve for the maximum number of consecutive terms to be served to be extended to three*. Existing clauses 12.5.7 to 12.5.12 to be renumbered accordingly.

4.3 **Deputy Chair** The item was noted. Council was asked to think about possible nominees and that someone well connected to schools networks would be particularly beneficial.

4.4 **Elected and coopted trustees** The Secretary corrected this item. The second paragraph was deleted to be replaced with the following:

At the end of the November AGM Sofya Lyakhova will have completed the year of her appointment under clause 12.6.7. She will have completed five consecutive years as a trustee.

A call for nominations for Elected Trustees will be circulated by the end of August with nominations required by the end of September. If needed, elections will take place at the November AGM on 7 November 2024.

4.5 **JMC Secretary** The item was noted. The Secretary stated that he would be very happy to discuss the role with any interested parties.

5 Reports from Committees

5.1 **BCME** The report was noted.

RT confirmed that the four officers were continuing and had already met. Previous committee members were being asked about continuing. Largely, the response is positive and the committee is due to meet in September It would be good to have a JMC trustee on the committee.

Council agreed that a move from Easter to October sounded sensible. There was also agreement of the conference being Friday and Saturday which would help access and keep the cost down.

A paper with detailed thinking is to be prepared for the November meeting – **Action: BCME Co-Chairs**.

5.2 **MMSA** It was reported that the MMSA organisations were still exploring the possible merger. A project manager has been engaged to do work on some underlying issues and will report in September. Due diligence will follow.

The organisations are meeting regularly and still talking and cooperating well.

A written update was requested for the November meeting – **Action: MMSA**.

6 Updates

6.1 **Teacher degree apprenticeships**

Announced in February, 8 institutions are involved in the development and pilot of teacher degree apprenticeships. Recruiting of up to 150 prospective teachers is taking place this year for a 2025 start; entry requirements are not known. Institutions are expected to utilise existing resources. The apprenticeship is for 4 years with lots of time in school although there is no detail at the moment. There is concern around funding and where it will be from. Schools have questions as to where and when placements will start and the apprentices pay.

6.2 **Academy for the Mathematical Sciences**

The report was noted.

Lynne McClure has been undertaking sensible work on the education front. There is a desire to highlight what can be done with mathematics and there is a tweet concerning this; please re-tweet as much as you are able.

The Chair has been involved in shaping the education element. However, the education group is formed largely around HE. The scope and purpose for the Education Committee needs to be developed which encompasses all. The relationship with HE needs to be clear; there is a risk of capture by HE. The question of fellowships and their relevance to all parts of the community including school teachers.

6.3 **Multiply trials**

Due to purdah this item was not taken.

6.4 **Maths Week England**

This item was not taken.

7 Reports from Participating Bodies

The reports were noted. Additionally:

7.10 (MA) Problem Solving Schools is still going well. There will be another push in September. A conference will be held before the end of the year.

7.18 (RSS) The RSS is doing work on the value of data and statistics across the curriculum.

7.20 (STEM Learning) It was explained that the *Science Leadership Benchmarks* was aimed at teachers in schools and considered four areas. The *support for the mathematical demand within science* has developed over a number of years. The intention is to take good practice from mathematics into science departments.

8 Reports from Observing Bodies

The report from NCETM was noted. The Chair highlighted the *headteacher's guide to Maths Hubs* and *Smoothing the KS2 into KS3 maths transition.* The latter is seeking to provide more support for secondary schools in dealing with students who are not ready for secondary (due to the impact of COVID). Part of this is the need for secondary teachers to be skilled on aspects of the primary maths curriculum and methodology.

There is targeted support for schools with struggling maths departments with experienced local leaders going in to assist.

Additionally:

8.8 (RS) Sam Murphy reported that the Mathematical Futures report has been finalised and is working through the RS's review processes which should be completed in July. However, MF messages are being included in a lot of things going out from the RS. Adrian Smith, the President, is very supportive. Engagement activities will start soon. Any thoughts on promoting MF would be welcomed.

Due to the July election date, the representatives of government departments and bodies were in purdah.

9 Discussion: AI in (school) mathematics education

The meeting was joined by:

Manolis Mavrikis (UCL)
Michael Grove (University of Birmingham)
Ed Southall (Oak National Academy)

Manolis Mavrikis introduced himself as an ex-teacher now engaged in the study of AI, but always with application (to school education) in mind.
AI has come to the fore due to recent developments in generative AI. However, AI is not new and can be traced back to the 1950s. It has taken on a hero-villain dichotomy.
There is a well-established research community (AIED) going back 30 years. The applications in education raise different implications according to the type of AI. A taxonomy has been developed.
Specific feedback programming has now changed to the Large Language Model.
AI can support inquiry learning which is more open-ended and gives greater learner autonomy.
It would be useful to collect data to see what is happening in the classroom.
Important questions:
Are we building the right tools? (Just because we can doesn't mean we should.)
How can we leverage AI to elevate maths education?
Care must be taken not to re-invent the wheel.

A study is needed to capture lessons learnt from this space.
Possible research areas include the long term impact and future professional development needs.

Michael Grove agreed that generative AI had raised the focus on AI. He is involved in developing the Russell Group's framework, but is also working with other jurisdictions (Canada, Australia).
He is looking from the perspective of teaching.
Consideration needs to be given to how these tools work
Recent sensational stories have encouraged lots of misunderstanding. Generative AI is seen to be bad, but has been around for a long time.
Assessment and degrees are seen to be under threat. However, there is an opportunity to see AI as an opportunity. These tools exist and cannot be banned effectively. The threat is there is action is not taken.
There is the opportunity to make changes to teaching, learning and assessment processes. (Some) assessment might be seen to be due to tradition; a review is needed. Assessment processes could be diversified and the assessment load could be reduced.
There are challenges to the notion that all students will cheat with AI. Evidence coming through shows that students recognise AI as an aid to their own development.
There has been a study of c.1000 students as to whether they use AI and how. This has been echoed by a study of c.5000 students in Birmingham. These found that students are relying on AI to understand particular topics and/or modules they are having issues with, especially in statistics and maths. This can be problematic in terms of what generative AI brings up – 'hallucinating'.
A Hippi study resulted in a call for DfE to review assessment practices. There is a need to take ownership.
Initially laughed at in terms of problem solving solutions, this is not so much the case now.
Randomness is built in and has an impact.
Thought must not be at the margins. A coherent response/approach is required to educate students in appropriate ways.
Concerns are that, if turned to, students risk isolation in the learning process. Also, inequalities may develop – there is a big difference between free and paid for versions.
A strategy is needed: staff focused – a programme of development; student focused – ethical use; assessment processes – review.
There is a free conference in Birmingham in September.

Ed Southall introduced himself as the maths lead for the Oak National Academy. Oak National Academy is seeking to provide products for teachers that will assist in the reduction of their workload. There is an exploration of using AI achieving this. Two projects are being pursued. The first, which is live on the website, is a quiz designer which targets both the key stage and the subject with prompt questions; maths has been excluded from this. The second, which is in development, is an embellished version aimed at using prompts to create lessons with associated resources; this is proving trickier for maths than it is for other subjects.
There is a fine balance in helping teachers, teacher enabling resources versus teacher proof resources. The balance is not always right, but is moving towards teacher proof resources.
Teacher workload is in need of aid, but at what level? How much it engages with the teacher is an important factor.
The AI generation of actual maths is not good enough yet. AI is okay at solving.
It is difficult to develop trust between teachers and materials.
There is teacher frailty around some topics, etc. There are a few around who get things wrong and are not realising it. Therefore, there is a problem with tools that introduces these.
Strong use cases for AI: Imperatives – teacher solves what is in front of them; Misconceptions – incorporate (AI is good at identifying these); Explanatory knowledge - to make sense of (and not just do); Anecdotal knowledge – cultural, historic. AI is good at explaining and good at the history of topics.
Is trust a particular issue with maths?
We want AI to be the answer – this realistic?

There followed short question and answer session. During this it was stated that NRICH was doing some interesting work with Norway on rich problems. Treating AI as another student was promoted as a good strategy. Concern was expressed that different systems produced different answers and that repeated use of one system could also do this.

In closing the session, each of the presenters was invited to give hopes and fears in relation to the future with AI:

ES	Find real uses (from teachers) that are helpful to teachers. The hype around AI dies down.
MG	AI to be looked at in an evidence-based manner. The hype and sensationalism disappear. The development of new specific tools (which need self-validation). Currently tools are public.
MM	Use of the right tools for the right jobs. Teachers and students will need to be equipped to identify these. Tools will become better, but there will be a financial cost to their use which will affect equity of access.

10 Conclusion

The Chair thanked everyone present for their contributions during the day and closed the meeting.

11 Dates of future meetings

- Thursday 7 November 2024 – De Morgan House, Russell Square, WC1B 4HS
  (Deadline for papers: Thursday 24 October 2024)