

**JMC****Joint Mathematical Council  
of the United Kingdom****Minutes of the JMC Council meeting  
held at the Royal Society  
on Tuesday 22 February 2011**

The JMC is grateful for the financial support of the Royal Society

**Present***Officers*

Duncan Lawson	Chair
Gerald Goodall	Honorary Secretary
Paul Harris	Honorary Treasurer

*Executive Secretary*

David Martin	Executive Secretary
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*Members*

---	Association of Mathematics Education Teachers
Peter Lacey	Association of Teachers of Mathematics
John Monaghan	British Society for Research into Learning Mathematics
June Barrow-Green	British Society for the History of Mathematics
---	Conference of Heads of Departments of Mathematical Sciences
Colin Campbell	Edinburgh Mathematical Society
Nigel Steele	Institute of Mathematics and its Applications
Elizabeth Winstanley	London Mathematical Society
Paul Harris	Mathematical Association (acting representative for this meeting only)
Stella Dudzic	Mathematics in Education and Industry (see also RSS below)
Sally Barton	National Association for Numeracy and Mathematics in Colleges
Lynn Churchman	National Association of Mathematics Advisors
Stella Dudzic	Royal Statistical Society (see also MEI above)

*Co-opted members*

---	JMC International Representative
---	International Commission on Mathematical Instruction

*Observers*

Lynne McClure	Advisory Committee on Mathematics Education
Jeff Evans	Adults Learning Mathematics
---	Department for Children, Education, Lifelong Learning and Skills
Stephen Stanton	Department for Education
John Marriott	The Higher Education Academy Mathematics, Statistics and OR Network
Celia Hoyles	National Centre for Excellence in the Teaching of Mathematics
---	Office for Standards in Education
Louise Orpin	Operational Research Society
Martin Smith	Royal Society
Paul Scruton	School Mathematics Project
John Harris	Sector Skills Council for science, engineering and manufacturing technologies in the UK
Jonathan Bach	The National Strategies
Angela Mabee	Training and Development Agency for Schools
Bill Richardson	United Kingdom Mathematics Trust

*Also present*

Pat Drake	Evaluating Mathematics Pathways, for afternoon discussion item
Sue Pope	Qualifications and Curriculum Development Agency, attending in a personal capacity
Stefano Pozzi	Department for Education, for agenda item 19
Nick Todd	Northern Ireland

- 1 Apologies** Paul Andrews (UK representative to ICMI), Jenni Back (AMET), Diana Coben (ALM), Catharine Darnton (RSS), Luke Graham (TDA), Tony Holloway (DCELLS), Peter Johnston-Wilder (AMET alternate), Jane Jones (Ofsted), Teresa Smart (National Strategies), Libby Steele (Royal Society), Charlie Stripp (MEI), Ros Sutherland (JMC International Representative).
- 2 Welcome to new representatives, alternates, guests and visitors** New representative: John Monaghan (BSRLM).  
Alternates: Jonathan Bach (National Strategies), Stella Dudzic (MEI and RSS), Jeff Evans (ALM), Angela Mabee (TDA), Martin Smith (Royal Society).  
Pat Drake (EMP) and Stefano Pozzi (DFE) were also welcomed for their respective items.
- 3 Appreciation of departing representatives** Adrian Oldknow had had to stand down as Honorary Treasurer for personal reasons. Gerald Goodall led appreciation for his long and distinguished service to JMC.  
Appreciation also expressed to Sue Pope, for whom this was the last meeting in a QCDA capacity; and to Teresa Smart, for whom this would have been the last meeting for the National Strategies.
- 4 Minutes of the meeting of Tuesday 9 November 2010** *Paper JMC-2010-Nov-Minutes*  
Accepted.
- 5 Consideration of any matters arising from the Minutes that do not appear on the main agenda**
1. Minute 5 [possible one-day meeting of interested parties identifying key impact messages of international studies].  
Still no information available.
  2. Minute 6(a)(ii) [JMC involvement in Ofqual international comparison exercise].  
In progress. First stage (looking at syllabuses from other countries) should have been completed yesterday and reports were now to be compiled. The exercise was expected to be complete approximately end-March.
  3. Minute 7 [letter from Chair to DFE regarding absence of EMP presentation at previous meeting].  
An acknowledgement of the letter had been received. An EMP presentation would take place at this meeting.
  4. Minute 8 [BCME].  
Bill Richardson gave a brief update on BCME8 in 2014. The committee

had met in January at the East Midlands Conference Centre at the University of Nottingham. It was highly likely that this would be the preferred venue.

5. Minute 13 [letter to Nick Gibb regarding uncertainties in recruitment for teacher education.

No reply had been received, but today's AMET report (see Minute 15) would throw light on the situation.

- 6 **Appointment of new Honorary Treasurer for remainder of current session** Adrian Oldknow having had to stand down (see Minute 3), JMC Executive had appointed Paul Harris as JMC Honorary Treasurer for the remainder of the current session. Change of bank signatories had not yet been completed. Additional authorised signatories would be added.

- 7 **Reports from Executive**

- a. **Chair**

- (1) Under the JMC constitution, the Executive had power to co-opt up to two additional members. Paul Harris had been co-opted immediately after the last meeting but had now become Honorary Treasurer. The Executive had now co-opted Nigel Steele and Lynn Churchman with immediate effect.

- (2) Communications between JMC, the JMC representatives and their organisations would be an agenda item at the June meeting. The matter had been brought up partly through the ACME evaluation. The status of documents submitted to JMC was discussed.

**Resolved:** that any paper submitted to the JMC will be regarded as a public document unless it is clearly indicated, at the time of initial submission to the JMC Honorary Secretary, that it is confidential to JMC only.

- b. **Secretary**

Nothing to report

- c. **Treasurer**

On an initial inspection, the finances appeared reasonably healthy. Reserves were sufficient for JMC to operate for a year if necessary. Subscription renewal notices had been sent.

- d. **Chair of Nominations Committee**

Adrian Oldknow had also had to stand down in this capacity. Sally Barton had been appointed Chair.

Gerald Goodall had stood down on becoming JMC Honorary Secretary in case a conflict of interests should arise.

Nigel Steele had been appointed to the Committee. Another person was to be approached. **[Post-meeting note.** Alison Clark-Wilson, the new MA representative, subsequently agreed to be appointed.]

Andrew Davies and Julia Smith (a present and a recent member of the ACME Outer Circle) had been nominated to an Ofqual group on functional mathematics.

**8 Proposal to suspend the JMC Constitution in respect of elections in 2011**

*Paper JMC-2011-Feb-Constitution*

Chair explained that the intention was to have a more transparent process for election of Honorary Officers. If found satisfactory, formal proposals for amendment of the constitution would be brought forward later. The paper had been pre-circulated for comment; no dissenting comments had been received.

**Resolved:** to accept the proposals in paper JMC-2011-Feb-Constitution to suspend the JMC constitution in respect of elections in 2011.

**Formal notice given:** that the JMC Honorary Treasurer would be elected in 2011 according to the procedures set out in paper JMC-2011-Feb-Constitution.

**9 JMC International Representative**

Ros Sutherland was not present so there was no report.

**10 UK Representative to ICMI**

Paul Andrews was not present so there was no report.

**11 Working Groups**

**a. ICT and Mathematics**

Ros Sutherland had reported by email that there was still a little more work to do on the report. Chair added that it was hoped to present the report to JMC at the June meeting.

**b. Primary**

Lynn Churchman circulated a paper *adopted as JMC-2011-Feb-PrimaryWG*.

The paper contained terms of reference and membership of the Working Group. In carrying out the work, it was planned that it would complement that of NCETM; Celia Hoyles had confirmed that this appeared satisfactory. It was hoped to obtain funding but this was still in the planning stage. Ideas

included

- an initial e-meeting
- the hope that committee members' organisations would pay for travel
- a formal bid for funding
- that other ideas would be forthcoming.

Nigel Steele suggested that Sir Peter Williams might be approached for ideas regarding funding. Celia Hoyles suggested that it might be better to wait for a short while before looking for funding. Stephen Stanton added that decisions would soon be made which would provide clarification. Perhaps support for the actual production of the final report could be sought later.

## **12 Report from ACME** *Paper JMC-2011-Feb-ACME*

Lynne McClure noted the very high workload of the ACME Secretariat. She elaborated on some points in the report, especially

- item 1 [ACME membership], to stress the importance of the Outer Circle to complement ACME itself
- item 7 [National Curriculum consultation], to explain that it would not be possible for ACME to organise a meaningful conference to inform the consultation before finalisation of the first stage on 14 April
- item 9 [Mathematical Needs Project], to announce that the report would be launched at an event on 10 May.

Query was raised regarding item 6 [level 3 mathematics]: was there any news from the meeting to explore possible mechanisms for Higher Education to become more involved with the development/regulation of A-levels? Nigel Steele commented that the way to gain involvement was via representative bodies such as HoDoMS and CMS. Comment was made that CMS had hitherto focused on HE research and had little expertise in issues surrounding school-level mathematics. Nigel Steele responded that he would expect CMS to acquire that expertise by consulting with its constituent bodies.

Regarding item 4 [primary mathematics], Lynn Churchman asked for an update on the document to be sent to Nick Gibb. Lynne McClure replied that it was nearly finished.

## **13 Report from NCETM** *Paper JMC-2011-Feb-NCETM*

Colin Campbell asked about funding for NCETM and was informed that this was still not clear. There was a brief general discussion.

## **14 Higher Education** Elizabeth Winstanley reported verbally.

UCAS data on numbers of applications now pooled mathematics and computer science (Duncan Lawson commented that disaggregated data would be available later). Up to 24 January, applications were up 8.6% on last year. This would be dominated by the much larger numbers for computer science,

but anecdotally it was thought that mathematics applications were up by around 10% to 12% (and that computer science applications had now bottomed out and were turning up again).

The LMS and HoDoMS were planning a joint education day on issues related to admission to HE and on lecturer training, probably around end-May.

The LMS was looking into IT in HE mathematics teaching.

The report of the IRM review had been released. [IRM is the (2010) International Review of Mathematical Sciences, commissioned by EPSRC. See <http://www.epsrc.ac.uk/research/intreivs/2010maths/>.]

Panel members for the Research Excellence Framework (REF) review of research to be undertaken in 2014 had been announced. See <http://www.hefce.ac.uk/research/ref/>.

**15 Teacher Education**

*Papers: JMC-2011-Feb-AMET  
JMC-2011-Feb-AMET-Annex-A\_ITT-allocations\_2011-12  
JMC-2011-Feb-AMET-Annex-B\_Targets\_and\_allocation\_methodology*

Both the AMET representative and the alternate were unavoidably absent. Martin Smith thought, and Angela Mabee confirmed, that mathematics numbers were being preserved despite cuts in some other subjects. The £9000 bursaries (see point 3 in JMC-2011-Feb-AMET) were to continue. Celia Hoyles commented that Teach First allocations, not included in the numbers in the AMET papers, were up a little.

**16 Operational Research**

Louise Orpin again introduced herself as the Education Officer at the OR Society. She said she was pleased to be at JMC and would welcome any contact from JMC members.

-- **Additional item – UK Mathematics Trust**

Bill Richardson had brought copies of the most recent UKMT yearbook and hoped that everyone had obtained a copy. Anyone without was asked to contact him.

**17 Update on current developments**

**a. DCELLS**

*Paper JMC-2011-Feb-DCELLS*

Tony Holloway was not present. The report was received.

**b. National Strategies**

Jonathan Bach circulated a paper from Teresa Smart *adopted as JMC-2011-Feb-National\_Strategies\_Teresa\_Smart\_personal*.

Despite the winding down of the National Strategies, it was confirmed that the field force was continuing until 31 March. It was hoped that at least some of its members would be available in some form of consultancy mode to support schools after the end of the Strategies. It might turn out that materials would be reissued, perhaps as some sort of archive. The CD mentioned in the paper was circulated to all present. It may be freely used.

Teresa Smart had reported by email, stating that she would ensure that any final information about access to legacy resources was communicated to JMC via NAMA or NCETM. She would be returning to the IoE.

#### **c. Northern Ireland**

*Paper JMC-2011-Feb-NI*

Nick Todd highlighted items in his report

#### **d. Ofsted**

Jane Jones was not present so there was no report. She had previously emailed to state that the post-16 numeracy survey mentioned in earlier reports was now proceeding through the Ofsted publication system, and she thought it might be published in March.

#### **e. QCDA**

Sue Pope commented that the linked pair GCSE Mathematics pilot was proceeding. Linked pair materials would be transferred to the DFE website at some stage, after the closure of QCDA.

#### **f. TDA**

Angela Mabee reported that targets had been released (see also Minute 15). There had not been quite as many applications as previously but she thought that the targets would be reached. TDA was also looking at subject knowledge enhancement courses and at TDA events for potential teachers (at which assistance would be welcome).

### **18 Reports from meetings**

Gerald Goodall reported briefly on the OCR Mathematics Forum which had recently been held. OCR had undertaken to issue Notes that could be circulated.



- 19 Presentation and discussion on the National Curriculum Consultation** [This item was taken between Agenda Items 17(b) and 17(c.)]  
Stefano Pozzi from DFE was welcomed to the meeting for this item. He based his presentation on a set of slides that were *adopted in PDF form as JMC-2011-Feb-NCconsultation*.  
The presentation outlined the background to and organisation of the consultation, and was followed by a lively discussion.
- 20 Any other business** Lynn Churchman circulated a discussion paper on the National Numeracy Trust.
- 21 Dates of future meetings** Tuesday 7 June 2011  
Tuesday 8 November 2011  
Tuesday 28 February 2012  
All at the Royal Society.

## DISCUSSION ITEM

### Evaluating Mathematics Pathways (EMP)

#### Introduced by Pat Drake

Pat Drake explained that Evaluating Mathematics Pathways 2007–2010 was the independent evaluation for the QCDA of Phase 2 of the Mathematics Pathways Project, established as a result of the Smith Report (2004). She briefly explained the methodology of the evaluation. The final report had been submitted to QCDA in December 2010 but was not yet publicly available.

The pathways model of two GCSEs in Mathematics that had been piloted from 2007 to 2010 had not been adopted (it did not comply with changed regulations on common content). But piloting examination questions aimed at assessing functionality and the capacity to solve mathematical problems has helped to prepare Awarding Bodies for the new "linked pair" GCSE. Many assessment items that had been studied by EMP had been very structured, focusing mainly on recall of techniques, but innovative question styles had appeared in the pilot GCSEs, particularly in the GCSE Additional Mathematics, and had motivated some learners, especially higher attainers.

Pressure on schools to maximise the number of students attaining a grade C or better at GCSE, combined with the demise of Key Stage 3 tests, had resulted in an increasing trend of early entry. Many students, including the highest attainers, could end up doing no mathematics in Year 11 if they had banked a "good" grade, though there was variation in practice. Students in 11–16 schools were more likely to be entered early than those in through schools.

Pilot A-level Use of Mathematics had attracted new populations of students into mathematical study. It appeared to have done its job well (but with a cautionary note about the small sample size of responses for evaluation) and was inspiring pedagogies that motivated and engaged students. Most students taking A-level Use of Mathematics had achieved B or C at GCSE Mathematics; they had mostly chosen Use of Mathematics because they wanted to continue with some mathematics but not the full A-level Mathematics. Pilot GCSE Use of Mathematics, to become a Level 1/2 Certificate, had been well received and had the potential to provide a more worthwhile learning experience for students who left school at 16 without achieving a grade C in GCSE mathematics.

Remaining challenges included:

- Transition at 16. Curriculum continuity was better in through schools, as was advice and guidance. Structural discontinuities, for example in data sets, made it hard for teachers to track students on either side of the transition. On the other hand, more mathematics options were commonly available in post-16 colleges. Teachers in 11–16 schools needed more support in advising choices beyond 16.
- Algebra. GCSE did not, in practice, prepare students for algebra at level 3. The more difficult material tended not to be taught; also there were issues surrounding its assessment.
- Recruitment to A-level Mathematics. This remained for the "clever core". Also, there was some evidence that clever girls might be attracted to Use of Mathematics rather than Mathematics.

There was evidence from use of the International Baccalaureate that students, high attainers in particular, liked having a wide range of subjects including serious study of mathematics but not necessarily in the style of the familiar A-level.

Recommendations:

- Use of Mathematics qualifications be adopted post-pilot in order to create new pathways.
- There must be effective CPD for curriculum leaders on how to design pathways using the available suite of mathematics qualifications, taking account of school structures.
- High attaining students need to develop greater facility with algebra by age 16 and assessments should incentivise high quality teaching and learning in this critical area.
- There should be further scrutiny of qualifications, combining analyses of assessment design with careful examination of students' responses, to give a better indication of the extent to which assessments are measuring what they purport to assess. This would be particularly relevant for the newly introduced problem solving questions.

Pat concluded by commenting that developing appropriate mathematics qualifications remained challenging because inherent conservatism made curriculum change difficult, especially as mathematics was a hurdle for schools and students. However, employer groups were concerned about the efficacy of school mathematics at 16; many used A-level as a gatekeeper rather than GCSE, whereas others deliberately ignored GCSE as introducing an unnecessary hurdle. An important issue was contested parity of esteem between GCSE (or Certificate), A-level Use of Mathematics and A-level Mathematics.