

Diana Johnson MP
Parliamentary Under-Secretary of State
for Schools
DCSF
Sanctuary Buildings
Great Smith Street
London
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15 March 2010

Dear Ms Johnson,

Science and Mathematics Secondary Education for the 21st Century: Report of the Science and Learning Expert Group

The Advisory Committee on Mathematics Education (ACME) warmly welcomes the report of the DCSF/BIS Science and Learning Expert Group, led by Sir Mark Walport. It is an excellent overview of the key issues in the teaching, learning and assessment of science and mathematics in schools, and we would like to highlight the aspects of the report which are of particular importance to mathematics education.

We would be keen to hear from you how the following recommendations from the report will be taken forward by the Department:

1. *Programmes for recruitment of science and **mathematics specialist teachers** should be maintained and extended (Recommendation 1 of the report).*

This is a key recommendation and one which underpins the success of much of the rest of the report. In particular, we would like to emphasise the importance of the Mathematics Specialist Teacher (MaST) programme. We were pleased to note the announcement of £11.8m in funding for the MaST programme in 2010/11, but long-term commitment is essential in order to deliver on this key recommendation of the Williams Review.

2. *There should be an entitlement to **subject-specific CPD**, with suitable incentives and recognition for teachers completing this (Recommendation 6, and paragraph 68). Money for CPD should be ringfenced, with a quality assurance Kite Mark developed (para 74).*

Entitlement to CPD that improves subject knowledge and subject-specific pedagogy is essential to improving mathematics teaching and to support government initiatives in schools if there is to be any meaningful changes in classroom practice. We note that the NCETM is piloting a maths-specific CPD standard as a quality indicator.

3. **Subject-specific pedagogical training** should be prioritised in Initial Teacher Training and in the Masters in Teaching and Learning (MTL) qualification (para 56).

ACME has written to the TDA to express its concern at the lack of development of subject knowledge and subject-specific pedagogy in the MTL at present.

4. **Standing STEM expert groups** should be created to advise on the development of 5-19 curricula and GCSE/A-level criteria (Recommendation 9).
5. Ofqual should report to parliament on its **engagement with the subject communities** (Recommendation 9).
6. **Awarding Organisations should be prevented from endorsing text books, and from allowing market forces to lead to a lowering of standards** (Recommendation 12, and para 103).

ACME has highlighted these issues ((4), (5) and (6) above) in its response to Ofqual's recent consultation on *Regulating for Confidence in Standards*. We believe that the current mechanisms for engaging with the subject communities are not transparent, and are working with colleagues at SCORE and E4E to explore what standing STEM groups might look like.

7. If the pilot of the **GCSE Mathematics pair** is successful it should be made available to all students (Recommendation 10). *Mathematics content should be boosted substantially within 14-19 science education.*

ACME looks forward to the results of the pilot, and agrees strongly with the report's recommendation that the linked pair should replace the single GCSE option so that all students follow both specifications. We are in contact with SCORE and other STEM partners regarding improving the mathematics content of science education. We also endorse the call for QCDA to evaluate the impact of the new criteria in GCSE and A-level science in relation to the assessment of mathematics (Recommendation 11).

In addition, ACME would like to highlight the following issues that are hinted at in the report but not currently flagged for further action:

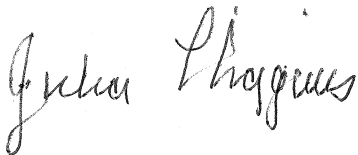
8. *There is an inherent danger that assessment becomes 'the tail that wags the dog' – i.e. that learning becomes directed solely at ensuring the best examination results* (para 86). ACME believes this has already become the case, particularly at the end of Key Stage 2 (KS2), and is working with DCSF and the Expert Group on Assessment to pursue issues relating to the retention of end of KS2 tests in mathematics and the introduction of the Schools Report card in order to address these concerns.
9. *It is well nigh impossible to design a single form of summative assessment that serves students of all levels of ability, particularly in science and mathematics* (para 9). ACME is in correspondence with QCDA and the Department regarding the need to retain the Advanced Extension Award (AEA) at Level 3 in mathematics for precisely this reason.

ACME does not believe that the introduction of the A* grade at A-level will satisfy the need for the most able mathematics students to be able to tackle more challenging questions, but as it stands this extension qualification will be withdrawn in 2012. In addition, we are continuing to press DCSF, QCDA and Ofqual to recognize the differences in teaching and assessment that exist between different subjects, rather than simply applying a one-size fits all approach.

10. ACME is in correspondence with DCSF officials regarding the increasing tendency for schools to enter pupils for GCSE mathematics up to two years early and allow them to 'drop' mathematics in their final years if they achieve a grade C – this is a serious issue and requires further investigation. Similarly, the issue of the current two-tier model at GCSE Mathematics is one which greatly concerns ACME, with growing anecdotal evidence that it is resulting in students being less well equipped for progression to AS and A-Level Mathematics.

I commend the work of the Science and Learning Expert Group and look forward to hearing how the recommendations above are being taken forward.

Yours sincerely,

A handwritten signature in cursive script, reading "Julia Higgins".

Professor Dame Julia Higgins FRS
Chair, ACME

Cc: Rt Hon Lord Drayson of Kensington, Minister for Science and Innovation
Sir Mark Walport