

The work of Ofqual: Commons Education Select Committee inquiry October 2015

1 About ACME

- 1.1 The Advisory Committee on Mathematics Education (ACME) is an independent committee that develops advice to influence mathematics education policy. ACME was established in 2002 by the Royal Society and the Joint Mathematical Council of the UK with the explicit backing of all major mathematics organisations in order to provide constructive advice on mathematics education.
- 1.2 In this response ACME would like to draw the Committee's attention to the positive approach that was undertaken by Ofqual in the past year in relation to GCSE Mathematics reform and urges a similar approach for A level. ACME also outlines some concerns around mathematical progression from primary to secondary level. Finally, ACME notes the importance of transparency of subject expertise when reforming and implementing policy.

2 Assessment of GCSE and A level Mathematics

- 2.1 Assessment determines the way in which students are taught in the classroom in the current system. In recent years mathematics assessment has not always fostered mathematical knowledge and skills, nor tested students on unfamiliar problems and multi-step unstructured tasks. There has been a commitment in recent reforms to increase problem solving and reasoning in assessment. ACME supports the move to ensure a greater emphasis on problems requiring multi-step solutions, which will assess different strands in the problem solving process. **Recognising that mathematical problem solving may seem difficult to assess, we welcome Ofqual undertaking further work in this area.**¹
- 2.2 **ACME welcomes the considered approach that Ofqual took in the past year when looking at GCSE Mathematics, conducting a large research programme and publishing research analysis and evidence.**² Updates were provided on the research programme in a number of innovative ways including blogging, which is also to be welcomed. **ACME recommends that a similar considered approach is undertaken for A level.** Following recommendations from the A level Content Advisory Board (ALCAB) to look at how to ensure that problem solving is assessed at A level,³ Ofqual set up a group to look at the assessment of AS/ A level Mathematics and Further Mathematics and ACME looks forward to their views.
- 2.3 Through correspondence and in a number of meetings ACME and Ofqual discussed a number of issues around mathematics assessment. Some positive changes were made, for example, the decision to delay the introduction of the new A level Mathematics and Further Mathematics to 2017.

¹ ACME is also currently undertaking work on the assessment of problem solving across phases.

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/429117/2015-05-21-gcse-maths-research-on-sample-assessment-materials.pdf: In this report it was Ofqual's view that problem solving questions were not necessarily 'hard' questions. The report also notes that a corollary is that problem solving may be validly assessed in GCSE examinations and that it is possible to create valid problem solving questions worth a small number of marks.

³ See <https://alevelcontent.files.wordpress.com/2014/07/alcab-report-on-mathematics-and-further-mathematics-july-2014.pdf>, p. 6: 'As mathematics often acts to support other disciplines and to address concerns raised in many disciplines about the need for students to have better problem-solving skills, we are suggesting a change in emphasis within the single A level in mathematics towards problem solving, interpretation and testing understanding. This should drive assessment with less structured question that test understanding and help to develop strategies for solving problems either in a purely mathematical or in an applications context.'

Some concerns still remain around the size of the new GCSE Mathematics⁴ and the tiering model chosen.⁵ **ACME recommends that Ofqual takes a watching brief on these issues and reports back in due course.**

2.4 The aims of the National Curriculum focus on problem solving, reasoning and fluency. These are aims that ACME support. However, ACME has concerns that the recent performance descriptors set out in the Mathematics Test Framework, sample test materials and mark schemes, particularly at Key Stage 2, will undermine the current efforts being undertaken to realise the aims of both the primary and secondary National Curriculum. As noted above, ACME welcomes the focus that Ofqual has placed on increasing the rigour of assessment of problem solving in the GCSE Mathematics to support the aims of the secondary National Curriculum. ACME is, however, concerned that the approaches from the Standards and Testing Agency and Ofqual do not seem to be aligned. If pupils do not emerge from primary schools with flexible, fluent skills in calculation which they can apply with confidence to mathematical problems, the aims of GCSE Mathematics and post-16 qualifications will not be realised. **ACME has alerted Ofqual and the Standards and Testing Agency to its concerns about the potential detrimental effect that Key Stage 2 assessment of the kind recently published could have on secondary mathematics learning.**⁶

3 Subject expertise and Ofqual

3.1 ACME believes that a wide range of subject experts with experience across all phases of education need to be involved in education reform; their selection and involvement should be transparent.⁷ At times throughout the reform of GCSE and A level Mathematics, the process of gaining subject expertise was not sufficiently transparent. As a new way of assessing problem solving is being introduced, subject expertise will be of crucial importance as new reforms are implemented. **ACME urges transparency of subject expertise utilised as reforms to mathematics are implemented.**

⁴ ACME noted the difficulties in establishing a shared understanding of the size and relative weighting of one larger GCSE. A number of challenges around implementation have also been noted, including resourcing in schools, professional development and timetabling.

⁵ ACME was reassured that it was recognised that GCSE Mathematics needs to be tiered in order to ensure reliability of results and to ensure that all students can demonstrate their knowledge effectively in GCSE examinations. However, as ACME stated a number of times, an overlapping tiers model is not the best model for mathematics.

⁶ <http://www.acme-uk.org/news/news-items-repository/2015/2015/2015/9/acme-correspondence-with-the-sta>.

⁷ <http://www.acme-uk.org/media/20260/matheducationpolicy.pdf>.