

Association of Teachers of Mathematics

Response to the DFES consultation document 14-19: extending opportunities, raising standards

Introduction

1. Our response to the Green Paper has been arrived at by consulting with members of our association. Our members include teachers in schools, sixth form colleges and FE colleges, as well as mathematics advisers, numeracy consultants and teacher trainers. We welcome the opportunity to review the mathematics curriculum for the 14-19 age range and to consider how more young people can be encouraged to continue studying mathematics in the 16-19 phase.

The vision for the 14-19 phase

2. We share the vision for the 14-19 phase laid out in Chapter 1 of the Green Paper. We note, in particular, paragraph 1.14, which stresses the importance attached to making 14-19 education and training a coherent phase in which learners are offered choice and progression through appropriate and challenging programmes. We value the choice and flexibility offered by different but equally-valued academic and vocational pathways outlined in paragraph 1.22.
3. We strongly support the view expressed in Paragraph 1.3 that, in order to implement this vision we shall need to change the current practice in which young people divide into those who stay on in education and those who leave.
4. We also endorse the delivery of the pathways through flexible and integrated networks of providers and e-learning (paragraphs 1.4 and 1.23) and the acknowledgement that schools and colleges will need support for this (paragraphs 3.33 and 3.34).
5. We note the comment in paragraph 1.15, further amplified in paragraphs 6.5 to 6.20, about improving accessibility through such measures as the Education Maintenance Allowance. It is essential that priority is given to such financial support because, while young people can leave school at 16 and earn money, they may be discouraged from continuing with education and training for a further two years.
6. However, as ACME has pointed out in its response, we believe that there are inconsistencies within the Green Paper that could militate against its vision being achieved. While the Green Paper gives substantial consideration to curriculum models, we do not think that sufficient attention has been paid to the way in which the curricula might be assessed. The Green Paper (paragraph 2.2) states that GCSEs will continue to have an important role, but will over time evolve into a 'progress check'. It is difficult to see how this will happen when there is such significance attached to performance at GCSE, both by individual students and by schools as a result of the

league tables. To have a significant ‘terminal’ assessment half way through a coherent 14 – 19 programme of study makes no sense. The dichotomy concerning the importance of GCSE and its future seems unresolved. We believe that a radical look at the place of GCSEs is needed, as we argue later in this response.

Marking the start of the phase

7. We endorse the views outlined in paragraphs 1.17 and 2.2, that the numeracy strategy at key stages 1 and 2 and the key stage 3 strategy will ensure that young people will reach the age of 14 with a good understanding of the basics of mathematics. We believe that the assessment that takes place through the key stage 3 SATs needs to be given formal status, so that it is recognised in the market place and by higher education. This would then give young people more freedom to plan what mathematics they want to include in their individual learning plans for the 14 – 19 phase.
8. The quality of support given to young people when they are choosing their pathways at 13 will be crucial. This advice should involve both the school and the Connexions Service. Schools will need guidance and support, such as access to the toolkit you suggest in paragraph 2.7.
9. It is essential that it is made easy for young people to switch between academic and vocational pathways.

The content of the 14 – 19 curriculum

10. We are disappointed about the apparently uncritical acceptance that (paragraph 3.15) ‘most pupils would continue to sit GCSE in mathematics...’ without consideration being given to the suitability of this qualification. Chapter 3 assumes that the existing structure of GCSE and AS/A2 qualifications will continue; this appears to contradict the vision in Chapter 1 of the Green Paper of a coherent 14-19 phase.
11. Many of our members, and particularly those who teach students in the 14 – 19 age range, do not believe that the existing GCSE in mathematics is an appropriate course for the 14 – 16 phase. One respondent wrote: ‘Unchallenging and undemanding for many, whilst being thin and irrelevant for others’. We believe that current GCSE courses are neither a good preparation for the new AS and A2 specifications for mathematics, nor do they prepare young people adequately for vocational courses or the world of work.
12. Although the curriculum may need reviewing, it is not the main cause of these problems. What is distorting the curriculum is the nature of the assessment and (because of league tables and targets related to performance management of teachers) the overriding importance given to students achieving particular grades. This encourages teachers to concentrate on teaching students how to do well in timed, written examination papers, rather than to develop the ability to think mathematically.

Consequently, many students learn mathematics as isolated chunks of knowledge and are not able to make connections between different ideas; making such connections is an essential part of being able to do and to apply mathematics.

Furthermore, the current model of assessment no longer meets the Cockcroft recommendation that mastery should be demonstrated. It is possible to achieve a grade C at Higher level by demonstrating very little knowledge of mathematics. This may be one of the reasons why so many students are finding the jump from GCSE to AS in mathematics so difficult.

13. The consequence of a GCSE dominated by performance in examinations that assess knowledge and techniques rather than the ability to solve problems is that young people are not becoming independent learners who will be able to engage in lifelong learning.
14. We note your comment in paragraph 3.26 that the more we treat the 14 – 19 period as a single phase, the greater the scope for young people to move at a pace best suited to their abilities and preferred ways of learning. While GCSE remains a high-status qualification at 16, this will not be possible.
15. We have considered your proposal that there should be an entitlement for all young people in the 16-19 phase to continue with the study of ‘numeracy’ until level 2 is achieved. We wonder if this is consistent with a GCSE in ‘mathematics’ in the 14 – 16 phase.
16. As ACME points out in its response (paragraph 6), vocationally-oriented mathematics should not consist of ‘low-status, watered-down academic mathematics’. Devising vocational mathematics courses is a challenge for the mathematics education community and ATM would be pleased to rise to this challenge.

Recognising achievement – a new award

17. We support the concept of an award or a diploma at 19 as a way of recognising that learning has taken place in a variety of ways (paragraph 4.4).
18. If this became the single award that marked the culmination of the achievements, at whatever level, of *all* young people in the 14 – 19 phase it would have much to recommend it. Currently, young people face far too many assessments. We would support a move towards more teacher assessment and towards a system where young people demonstrate their mastery of the curriculum through a portfolio of evidence.

Pace and progression

19. We recognise that there should be different rates of progression for different people. One of the appeals of a coherent 14 – 19 phase is that young people could progress through it at a pace of their own choosing, by taking a route that suits their own goals.

20. The Green Paper states in paragraph 5.7 that differentiated progress should not turn learning into a race. However, the Green Paper's suggestion that some students might take GCSE or AS/A2 modules early seems flatly to contradict this. We believe that such acceleration encourages superficial learning of new knowledge and techniques at the expense of gaining mastery through acquiring a deeper understanding of what students already 'know'. We agree with ACME (paragraph 9 of its response) that there is almost total consensus in the mathematics education community that we need enrichment rather than acceleration.

Conclusion

21. The vision of a coherent 14 – 19 phase outlined in Chapter 1 of the green paper is inconsistent with the suggested curriculum (chapter 3) and the use of targets and performance tables to drive up standards (chapter 7).
22. We believe in a coherent 14 – 19 phase that offers learners genuine choices through many different flexible pathways. Their progress should be assessed throughout the phase by means of a combination of external tests, teacher assessment and a portfolio of evidence, leading to a single award at 19 plus which recognises all their achievements.
23. We support ACME's view (paragraph 5 of its response) that this Green Paper provides an opportunity for the Government, working with the mathematics education community, to design some coherent and challenging four-year programmes that would fit the varied needs of all learners in this phase. The assessment of these programmes needs to address the extent to which students have achieved mastery of the curriculum and in this way provide information both to them and to their advisers about the next steps they need to take in order to continue successfully along their chosen pathways. We would very much want to contribute to such a venture.

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