THE ROYAL SOCIETY

RS ACME GCSE resits project: background

1 Current policy on retaking GCSE mathematics

In 2011, the Wolf Report[1] recommended that post-16 English and Mathematics should be a required component of study programmes for those without 'strong' GCSEs in these subjects (grade 4/equivalent to grade C or above). As highlighted in figure 1, in December 2014, the Government introduced new guidelines designed to ensure that pupils who failed to obtain a 'strong' pass in GCSE mathematics and English at the first attempt would continue to study for such a pass as a condition of funding regulations governing post-16 study.

The new condition of funding introduced for providers in England in 2014[2] means that colleges must help 16–19 students who achieved a grade 3 in English or Mathematics to retake their GCSEs as part of their sixth-form studies until they get a grade 4 or above.[3,4] Figure 1 summarises this mathematics policy context and some recent developments. From June 2019, students with a grade 2 or below can either take a GCSE or the reformed Functional Skills level 2 qualification launched in September 2019.

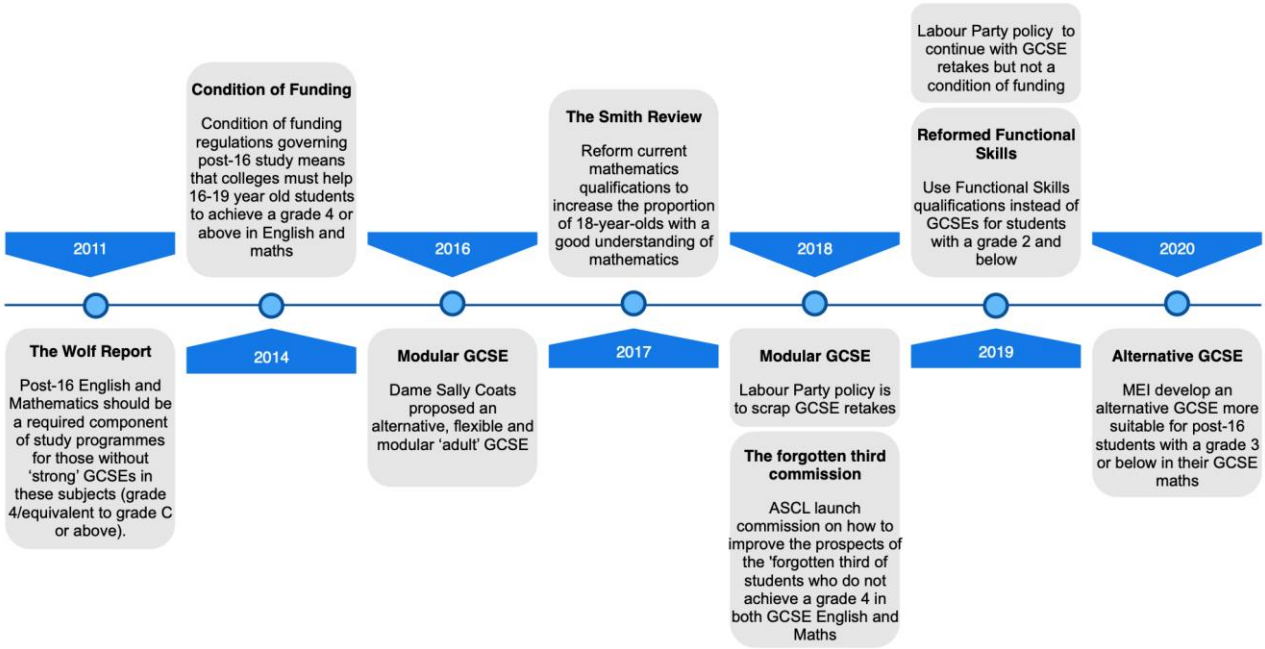

Figure 1. GCSE resits policy timeline

[1] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/180504/DFE-00031-2011.pdf, accessed 17 December 2019.
[2] See https://feweek.co.uk/2014/07/18/dfe-publishes-list-of-mandatory-qualifications-for-learners-without-grade-c-or-above-in-gcse-english-and-math/
[3] Department for Education Parliamentary Question, PQ 1614, 25 October 2019. (See https://www.theyworkforyou.com/wrans/?id=2019-10-17.1613.h&s=speaker%3A10225#g1613.r0)
[4] At present, students with a grade 2 or below can either take a GCSE or the reformed Functional Skills level 2 qualification launched in September 2019 and providers can choose which qualification is most suitable.

2 Achievement rates in GCSE mathematics post-16

More than a third of candidates do not achieve a standard (or strong) pass (grade C/4 or above) in their GCSE examinations first time around (figure 2). Further, the rates of success in meeting this benchmark among those resitting GCSE Mathematics have remained stubbornly low (figure 2).

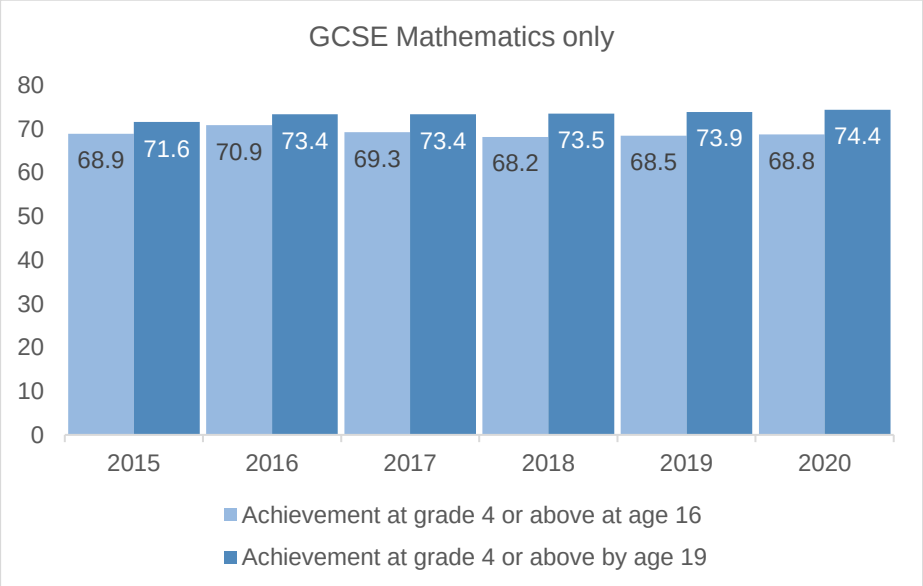

Figure 2. Students achieving GCSE Mathematics only (2015–20). Note: data for 2020 are not strictly comparable with previous years' results, due to changes to the assessment caused by the Covid-19 pandemic.

Source: Department for Education.[5]

Figure 3 shows that a slight rise in the number of GCSE Mathematics resit students awarded a grade C/4 in the two years immediately following the introduction of the condition of funding disappeared thereafter. While a substantial increase in the number of resitting students occurred with the introduction of the condition for funding, the percentage of post-16 candidates achieving grade C/4 has decreased considerable over time, and the proportion experiencing repeated failure has greatly increased.

In 2019, before the Covid-19 pandemic, over 180,000 students (up from about 160,000 in 2018) aged 17-plus were re-entered for GCSE Mathematics, but only 22.3% achieved a grade C/4 or above.[6] However, back in 2012, before the condition of funding was introduced, 43% of the 64,494 GCSE Mathematics resit entrants achieved grade C or above. Indeed, as figure 4 shows, there has been a steady decrease in the percentage of GCSE Mathematics resit candidates achieving grade C/4 or above since 2012.[7]

[5] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791405/L23_attainment_2018_main_text.pdf; https://explore-education-statistics.service.gov.uk/data-tables/fast-track/6cc4a41e-ac46-4c82-b28b-9461db057cda

[6] See Examination results - JCQ Joint Council for Qualifications

[7] See Examination results - JCQ Joint Council for Qualifications

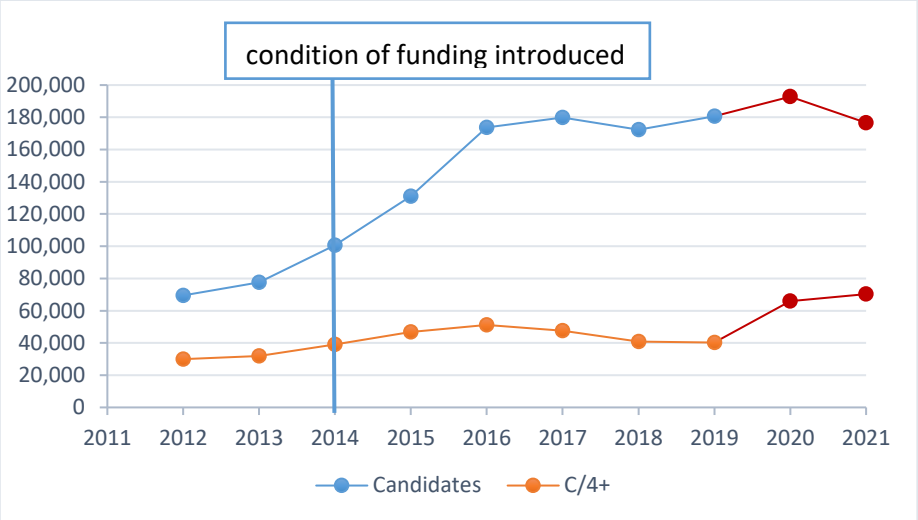

Figure 3. Numbers of candidates aged 17(+) sitting GCSE Mathematics students compared with the numbers gaining grade C/4 or above. Note: data for 2020 and 2021 are not strictly comparable with previous years' results, due to changes to the assessment caused by the Covid-19 pandemic.

Source: JCQ (UK data).

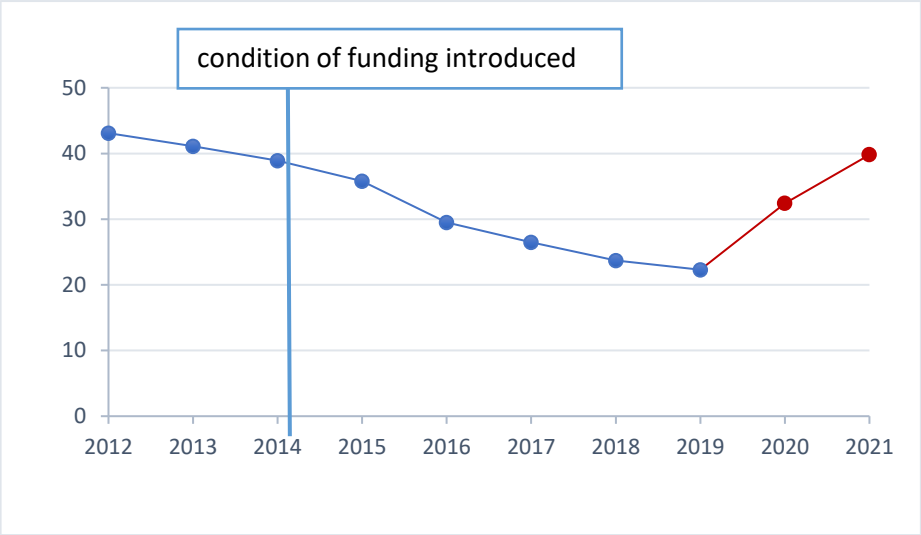

Figure 4. Percentages of candidates aged 17(+) sitting GCSE Mathematics gaining grade C/4 or above. Note: data for 2020 and 2021 are not strictly comparable with previous years' results, due to changes to the assessment caused by the Covid-19 pandemic.

Source: JCQ (UK data).

The Department for Education published data in 2019 showing that the progression rate in Level 2 English and mathematics (which measures those young people who had not achieved Level 2 in English and mathematics at 16 but had done so at age 19) by GCSE qualifications alone was 20.9% in 2018, up from 17.6% in 2017. Given the mechanism of 'comparable outcomes', the percentages of pupils attaining Level 2 mathematics post-16 (figure 5) have not changed substantially in recent years.

Worryingly, figure 5 shows that approximately one-quarter of students do not obtain a Level 2 mathematics qualification by age 19.[8,9]

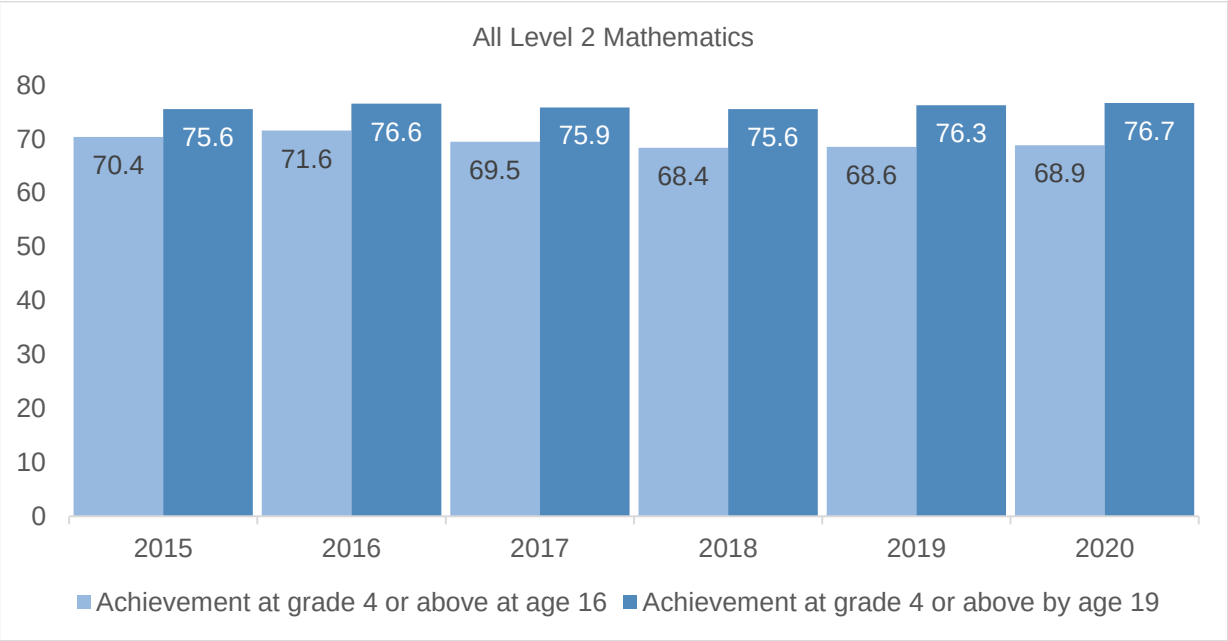

Figure 5. Students attaining level 2 mathematics (2015–20).[10] Note: data for 2020 are not strictly comparable with previous years' results, due to changes to the assessment caused by the Covid-19 pandemic.

Source: Department for Education.

2 Disquiet with GCSE resits policy

Doubts about the condition of funding policy surfaced when, in 2016, Dame Sally Coates in her review of prison education recommended an alternative, flexible and modular 'adult' GCSE.[11] While the initial ministerial reaction was negative, later that year Robert Halfon (then Minister for Apprenticeships and Skills) and the Chair of the Parliamentary Education Select Committee of the House of Commons, said he was 'open-minded' about proposals to create a modular 'adult GCSE' in English and mathematics.

In 2017, the Smith Review recommended that current mathematics qualifications could and should be reformed to increase the proportion of 18-year-olds with a good understanding of mathematics.[12] Since then, political parties and teaching associations have been critical of the GCSE resit policy. In

[8] See Education, Children's Services and Skills 2017/18 (publishing.service.gov.uk), pp. 10–11.
[9] See https://www.ascl.org.uk/Our-view/Campaigns/The-Forgotten-Third
[10] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791405/L23_attainment_2018_main_text.pdf
[11] See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/524013/education-review-report.pdf
[12] See https://www.gov.uk/government/publications/smith-review-of-post-16-mathematics-report-and-government-response

November 2018, Angela Rayner, Labour shadow education minister, told the Association of Colleges' annual conference that a Labour government would scrap the resits policy.[13]

Considering alternatives to resitting GCSEs post-16, in August 2019, Mark Dawe, Chief Executive of the Association of Employment and Learning providers, said that the introduction of the reformed Functional Skills qualifications meant that the current resit policy needed to end and that an initial assessment could be used to ascertain whether GCSE or Functional Skills would be most appropriate for each student.[14]

The consistently high failure rates that have been recorded illustrate a social policy problem. A complex set of factors is likely to contribute to the recorded low pass and progression rates in GCSE mathematics post-16 which then impact the students having to retake these qualifications, their teachers and training providers.

3 Impacts of GCSE resits policy

3.1 Impacts on students

Resitting or retaking an exam,[15] particularly for students who do so repeatedly (some of whom may never attain the required pass), is likely to be a demoralising experience. Impetus-PEF found that some students are resitting GCSE English or mathematics multiple times, even up to 9 times.[16] In 2018, Her Majesty's Chief Inspector set out the following aims of retaking GCSEs in English and mathematics: 'rather than creating the perception that English and mathematics study in FE is a punishment for not getting a grade 4 at an earlier stage of education, it should instead be pitched as a core part of vocational training. Learners should be able to appreciate that improving their literacy and numeracy is about genuinely improving their knowledge and their prospects for further training and employability, rather than simply something to cram for in a test.'[17] However, data published in 2018 showed that some students had sat their GCSEs as many as nine times but were significantly less likely to improve their grades while students in sixth form colleges were more likely to improve their grades[18]. Furthermore, 60% of young people from disadvantaged backgrounds do not have a Level 2 qualification (GSCE or equivalent) in mathematics and English by age 19, compared to only 30% of their better-off peers.[19]

A recent study for the Nuffield Foundation found that such students have low confidence levels and a tendency to rely on mis-remembered rules applied without understanding. They are often disengaged from mathematics and many do not see it as relevant beyond a pass grade requirement for entry to further training or jobs. Students' past experiences mean they lack both motivation and confidence when required to retake their mathematics GCSE, which might explain the low the resit success rate.[20]

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[13] See Labour would scrap GCSE English and maths resits policy (feweek.co.uk)
[14] See GCSE results: Government resits policy branded 'a disgrace' with less than a quarter of Maths re-takers passing. (aelp.org.uk)
[15] Resitting need not involve any additional study beyond the initial attempt(s).
[16] See https://impetus.org.uk/blog/2018/thousands-of-young-people-are-facing-an-endless-cycle-of-gcse-resits.
[17] *Op. cit.*, note 3.
[18] https://www.cambridgeassessment.org.uk/Images/476535-which-students-benefit-from-retaking-mathematics-and-english-gcses-post-16-.pdf
[19] See https://impetus.org.uk/policy/educational-attainment
[20] See https://www.nuffieldfoundation.org/sites/default/files/files/Hough%20-%20Main%20Public%20Output%20(Nov17).pdf

The Association of Colleges (AoC) found that resit students understood why mathematics was important for progression and many vocational students were able to explain how mathematical skills related to their vocational area.[21] However, although the students in this study had a positive view about their chances of improvement and appreciated the support they were getting from training providers, they also felt that they 'failed' mathematics rather than seeing additional mathematics study as progress towards a higher grade, thus establishing grade 4 as the minimum required for a 'pass'.

3.2 Impact on training providers

England's Further Education and sixth form colleges educate a substantial proportion of 16–18 year olds, with data from the Association of Colleges showing that, for 2016/17, 35% of this population were being educated in colleges compared to 23% being educated in state-funded schools.[22] In fact, since the change in policy, colleges have had to take on considerably more students for 16–18 mathematics programmes than was the case previously, something for which they were ill-prepared.

For instance, the condition of funding change meant that colleges had to restructure departments, recruit additional managers to provide leadership or support for mathematics and, against a wider national shortage, seek to recruit, train, and retain specialist mathematics teachers. Additional English and mathematics classes require complex timetabling which may have knock-on consequences for provision of other courses.[23] FE colleges have consistently suffered from under-funding, a fact recognised most recently by the Augar Review, and the costs of recruiting and training staff have served to put colleges under additional financial strain.[24] Issues with funding might mean that schools are not dedicating enough time to prepare for the resits and therefore are not giving students the chance to achieve a good grade.

The pupil characteristics of colleges and state-funded schools differ in key respects. Colleges generally teach many more students than schools. A higher proportion of college students claim free school meals (16% of 16–18-year-olds) compared to equivalent students in state-funded schools or academy sixth forms (8% of 16–18-year-olds). Colleges also have higher numbers of lower-attaining pupils than schools. The progress made in post-16 education by disadvantaged students who did not achieve a grade 4 in GCSE mathematics at the first opportunity is lower than that made by non-disadvantaged students.[25]

To compound matters, colleges are under severe pressure from inspections, targets and performance measures. Accountability and progress measures may be driving colleges to adopt behaviours that they do not desire and are not necessarily in their students' best interest. In particular, the pass/fail aspect of the FS qualifications is associated with a risk of high failure rates, and colleges may therefore be deterred from offering these qualifications in order to avoid the possibility of laying themselves open to an Ofsted inspection. Additionally, colleges may be at risk of losing funding if students who failed to gain a grade 4 in GCSE Mathematics fail to attend mathematics classes.[26]

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[21] See https://www.et-foundation.co.uk/uncategorized/cfem-blog-how-do-students-feel-about-retaking-gcse-mathematics/
[22] Smith, J & Dalby, D 2019 Retaking GCSE mathematics: a discussion document on post-16 policy, practice and possible futures. See https://royalsociety.org/topics-policy/education-skills/mathematics-education/gcse-mathematics-resits
[23] *Ibid*.
[24] See https://www.gov.uk/government/publications/post-18-review-of-education-and-funding-independent-panel-report
[25] *Ibid*.
[26] Smith, J & Dalby, D 2019 Retaking GCSE mathematics: a discussion document on post-16 policy, practice and possible futures. See https://royalsociety.org/topics-policy/education-skills/mathematics-education/gcse-mathematics-resits

3.3 Impact on teachers

Research conducted for the Nuffield Foundation has revealed that teachers face various challenges in preparing students to re-sit mathematics GCSE, including:

- the short amount of time teachers have to prepare students for resitting the examination, which is insufficient to be able to address gaps in their students' knowledge, and build their confidence;
- the lack of access to sustained professional development to handle these challenges;
- the fact that many teachers being drafted into teach resit students are not mathematics subject specialists; and
- a lack of confidence, and motivation, in teaching resit classes.[27]

3.4 Wider impacts

The compulsion for students without a GCSE grade 4 (or higher) to resit mathematics is likely to have knock-on negative consequences for the take-up of the new T Level qualifications since entry onto these courses will normally require a grade 4 or above in GCSE English and mathematics. Further, given the Government's decision to withdraw funding from Applied General Qualifications, the options available for students have narrowed.[28]

4 Initiatives aimed at addressing challenges with GCSE resits policy

Current initiatives to address the challenge with improving students' attainment in mathematics post-16 include the Centres for Excellence in Maths (CfEM) programme.[29] Funded by the Department for Education, the CfEM is a national improvement project aimed at delivering a step change in mathematics teaching up to Level 2 in post-16 settings. The core objective is to support 21 Centres to help increase the number of young people leaving compulsory education with basic mathematics skills, up to GCSE and equivalent level.

In addition, with support from the Nuffield Foundation, Mathematics in Education and Industry (MEI) has developed a new mathematics GCSE curriculum for post-16 resit students with an emphasis on applying mathematics in realistic contexts than the current GCSE mathematics.[30]

In 2020, the University of Nottingham published *Mathematics in Further Education Colleges*. Funded by the Nuffield Foundation, this study reported findings of a programme of research completed in 2018/19, which lays bare the complex set of challenges that need to be met if mathematics learning and achievement in England's colleges is to improve.[31]

[27] See https://www.nuffieldfoundation.org/sites/default/files/files/Hough%20-%20Main%20Public%20Output%20(Nov17).pdf
[28] See Review of post-16 qualifications at level 3 in England (publishing.service.gov.uk)
[29] See The Centres for Excellence in Maths Programme - The University of Nottingham
[30] See New mathematics GCSE curriculum for post-16 resits | Project | Nuffield Foundation
[31] See final-report.pdf (nottingham.ac.uk)