# ROYAL STATISTICAL SOCIETY

**DATA | EVIDENCE | DECISIONS**

**ROYAL STATISTICAL SOCIETY SUBMISSION TO THE EDUCATION COMMITTEE INQUIRY INTO FURTHER EDUCATION AND SKILLS**

7 March 2025

## 1. Introduction

### 1.1 The Royal Statistical Society

1.1.1 This is the submission from the Royal Statistical Society (RSS) to the Education Committee's inquiry into Further Education and Skills. The Royal Statistical Society is a professional society for statisticians and data scientists, with over 11,000 members, as well as a charity. Our vision is a world where data is at the heart of understanding and decision-making.

1.1.2 One of our strategic goals centres on supporting public engagement, working to ensure that people – of all ages – have an understanding of the data and statistics that influence their daily life decisions, their work and the world around them, and feel empowered to meaningfully engage with issues. This includes advocating to improve statistics and data content across curriculums and consideration of the best methods to assess these subjects, as well as the support needed to upskill teachers.

### 1.2 Statistics and data in education

1.2.1 Data and statistics are ubiquitous, and statistical and data literacy are essential to navigate everyday life as well as in a broad range of job and career pathways. School and post-16 education must equip young people with the skills to navigate and thrive in the 21st century data landscape.

1.2.2 Current challenges in the UK education system include students leaving the education system without the statistical and data skills they need to navigate daily life; students not enjoying statistics; and challenges around assessment – which does not reflect the practical nature of the subject.

1.2.3 A key goal for the RSS is for students to enjoy and engage with learning statistics and data science across all years of education, realising the relevance of these subjects and viewing

them as tools to understand the world around them. We want students to leave the education system equipped with the skills necessary to interpret data, interrogate claims, and handle figures needed for managing aspects of daily life (eg personal finances) and the world of work.

1.2.4 We focus here on issues facing statistics and data within the further education sector, with respect to the inquiries' terms of reference. We provide evidence on:

- Curriculum and qualifications in further education – the post-16 curriculum; the assessment system; post-16 numeracy and literacy, including GCSE resits;
- Delivering further education;
- Skills and apprenticeships;
- Supporting young people, widening access, and narrowing the attainment gap.

1.2.5 Our main recommendations are:

a) Update statistical literacy components of A-Level Mathematics to better reflect how skills are used in work and at university.
b) Greater use of non-examination assessment for statistical and data skills.
c) An alternative maths qualification for the 'forgotten third' (pupils who obtained below a grade 4 in English and Maths at age 16), building on previous functional skills qualifications.
d) Increased resources for teachers to support the teaching of statistics and data.
e) Information on statistics and data apprenticeships should be improved, including on provider quality as well as on course content and the skills that will be taught.
f) It is important to consider pre-16 education rather than look at post-16 education in isolation; we recommend separating statistics/data from maths and offering students the option to sit two GCSEs, one in maths and one in statistics/data, or one combined GCSE composed of elements of both. This would allow for a cohesive statistical and data curriculum and allow students to recognise the skills they are learning.

1.2.6 We have previously published our views on statistics and data within the curriculum and draw on these here. Further information can be found in the below documents:

- [Response to 2023 'Maths to 18' proposals](#) (October 2023);

- [An Exploration of Non-degree Pathways into Data Analysis Careers](#) (October 2023);
- [RSS response to the DfE Advanced British Standard Consultation](#) (March 2024);
- [Key recommendations for the teaching of statistics and data in the UK](#) (August 2024);
- Briefings detailing [RSS manifesto](#) asks (May 2024) on the [curriculum and assessment](#) (September 2024) and on [maths teacher recruitment and retainment](#) (October 2024);
- [RSS response to Royal Society Mathematical Futures Programme report](#) (October 2024);
- [RSS submission to the DfE Curriculum and Assessment Review call for evidence](#) (November 2024);
- [RSS response to OCR report 'striking the balance: a review of the 11-16 curriculum and assessment in England'](#) (December 2024).

## 2    Curriculum and qualifications in further education

### *2.1    The post-16 curriculum*

2.1.1    We believe that discussion of the curriculum should begin with consideration of the skills that the country values and which are important for young people entering the workplace and to help them become informed citizens. It is important to have this understanding before thinking about how it translates into the curriculum and what should be assessed (rather than assessment dictating what is taught).

2.1.2    With the increase of technology, AI and data, statistical literacy and data skills are changing over time and becoming ever more important. Citizens needs to be able to interpret data and critically evaluate health, climate and political claims, as well as to manage everyday tasks like personal finances. Statistical skills and an understanding of data are needed for a majority of jobs – from informing human resourcing or policy decisions to engineering and manufacturing.

2.1.3    Statistical and data skills necessary to strive in the current environment include:

- statistical literacy, critical thinking and investigative skills (a mental toolkit) to be able to interrogate the origins and trustworthiness of data;
- data and numeracy skills to be able to interpret and handle figures for managing aspects of daily life, eg personal finances or understanding the risk of a medical procedure;

- an understanding of data, coding, 'artificial intelligence' and data ethics, so that students can grasp the mechanisms by which the technologies they encounter work and have an understanding of how to protect personal data;
- strategies to understand large figures encountered in everyday life, eg by putting figures in context and comparing them to known figures.

2.1.4    Post-16, take-up of Core Maths could be encouraged, as an initiative that allows students to continue learning maths relevant to daily life. We have heard reports of high student enjoyment of this qualification, but low take-up across education providers.

2.1.5    [General mathematical competencies](), which including processing and understanding data, are embedded in T-levels. It would be good to have a consistent maths/data framework across all vocational qualifications, and to make clear how connections could be made across all qualifications offered in Further Education institutes. These qualifications tend to have fewer examination-based forms of assessment, providing a good opportunity for students to develop skills in data handling and statistical literacy.

2.1.6    The statistical elements within A-level Mathematics are largely procedural and formulaic, focussing on learning statistical techniques instead of quantitative reasoning. Quantitative reasoning, the investigative cycle and statistical literacy skills are essential to daily life and are much sought-after skills across a range of disciples at university and across a range of job and career pathways, and should be given more emphasis.

2.1.7    Efforts should be made to ensure that where datasets are provided, such as within A-level Mathematics, these are on interesting, relevant topics and that the exercises centring on them will engage students. Working with datasets should provide students with the opportunity to learn actively, via 'doing'. In general, datasets included in examinations are often small (suitable for calculations by hand in an exam), but real-life datasets are typically large and analysed using software (eg spreadsheets or other platforms) - this type of dataset may be more relevant and engaging for students. A limiting factor is often lack of access to suitable IT in schools and colleges to be able to explore datasets, and we would like to see this overcome.

2.1.8    While this inquiry focuses on further education, we believe that it is important to also consider pre-16 education. By the time that students reach post-16 education, previous and possibly

negative experiences of maths can influence choices and the ability to pick up necessary skills. [Attainment gaps](#) exist before age 16. The aim is that improving pre-16 education can in turn improve post-16 education, with implications on student engagement, learning, and satisfaction. The use of interesting, real-world contexts (eg on current, topical issues) and increased emphasis on relevant skills has the potential to engage students.

2.1.9 Better connections should also be made between statistics and other disciplines teaching statistical concepts, data collection and analysis, and ethical use of data, at all levels (eg geography, biology, psychology and a range of other subjects). We would also like to see maths, statistics, and data education that harnesses the power of technology and involves education of digital skills across all levels – to reflect how these subjects are used in the real world.

### *2.2    The assessment system*

2.2.1 Assessment must assess the skills we value. It is crucial to rethink assessment, as it is challenging for teaching to change while pressures from the current assessment system persist.

2.2.2 Statistics and data science are practical subjects, and the RSS calls for greater use of non-exam assessment including coursework and project work. Projects and coursework can allow students to demonstrate competence with the full statistical cycle (planning, collecting data, analysis, communication, consideration of implications and limitations), and allow better assessment of skills such as reasoning, problem-solving and critical analysis. This type of project work would additionally better equip students for the project-based nature of many jobs. Continuous assessment could remove some of the pressure of high-stake exams and could allow students to log which skills and competencies they have. We explore ways to mitigate the risks associated with coursework in our [response to the 2023 Maths to 18 proposals](#).

2.2.3 We also call for the use of more engaging real-world topics within assessments, and utilising technology in assessment and digital assessment.

### 2.3 Post-16 numeracy and literacy, including GCSE resits

2.3.1 Limitless resits of GCSE Maths for students who have not passed will only demotivate students further, and will not succeed in equipping students with the skills they need.

2.3.2 An alternative qualification, more appealing and relevant to daily life skills, should be introduced for students who have not passed after one resit. A better solution is needed for this group – we suggest working to identify the skills that are essential for navigating life (from our perspective this includes statistical and data literacy) and teaching and assessing them in a different way. Previous qualifications in this space include the functional skills maths qualification – the development of a data-specific functional qualification could be helpful. The OCR's recent proposal for a [Short Course GCSE Maths](#) also sets out to address the well-known issue of resits.

2.3.3 The current GCSE syllabus does not contain enough statistics and data relevant to daily skills for the majority, let alone the 'forgotten third'. We call for increased emphasis on the skills needed for everyday statistical and data literacy within the GCSE curriculum.

## 3 Delivering further education

3.1.1 We recognise that improvements in teacher supply, skills, and wellbeing are needed in order to make improvements to the curriculum and assessment. Teacher pay has been decreasing in real terms over the last decade, in contrast to the private sector, and this is especially an issue for STEM subjects such as maths where candidates have a wide range of alternative highly-paid options, after graduation or as a side-step once in post.

3.1.2 A shortage of teachers confident in statistics leads to fewer education providers offering this subject or teaching data skills well, and support is needed in upskilling teachers in this area.

3.1.3 Teachers who are overworked and are not enthusiastic about what they are teaching will not be able to inspire students and equip them with the relevant skills. We recognise the need to ensure that teachers are brought along with new curriculum plans; it is crucial that teachers are invested and passionate in order to be able to inspire students.

3.1.4   As part of the Council for the Mathematical Sciences, we call for a year-on-year increase in maths teachers, by expanding scholarship schemes and guaranteeing subject-related CPD. Scholarship schemes have been demonstrated to boost recruitment (in a step to increase competitiveness against the variety of highly-paid alternative professions for STEM graduates) and subject-related CPD boosts teacher wellbeing and confidence, providing opportunities for progression and supporting retention. In addition, we call for a review of teachers' salaries – to ensure competitiveness across the levels – to support both recruitment and retention. We expand on these asks in [our briefing](#).

3.1.5   We also believe that teachers should be provided with easy-to-use resources (eg ready-made interactive datasets) to aid with teaching the data and statistical literacy skills that young people need. Teachers need more support and training to teach statistics successfully, including help finding interesting and engaging contexts to teach statistics. Many Further Education colleges offer PGCE and teacher training, and we call for increased focus on statistical and data literacy for teachers.

## 4   Skills and apprenticeships

4.1.1   [Research conducted by the RSS](#) in 2023 revealed concerningly low levels of statistics and data analysis training across the UK. In a nationally representative UK-wide survey of over 2,000 respondents, the research found that only 10% of people were aware of options for upskilling in data analysis, and only 13% of respondents felt they had the necessary statistical skills needed for their work.

4.1.2   [Ofqual data](#) suggests that there are no entry level, level 1 or level 2 vocational qualifications in statistics, with only one level 3 diploma in applied statistics taken by 5 students in 2023/24. More entry routes into statistics are needed.

4.1.3   The RSS research also explored the experiences of people who had undertaken data analyst apprenticeships. While participants were generally positive about their experience, they reported communication and access issues and highlighted a lack of detail and timeliness in the information from their course providers. Prior to enrolling, it was also difficult to identify the quality of individual providers.

4.1.4   The RSS calls for a review of the current online rating system for providers and to improve the accuracy and depth of information available on provider quality. We are also calling for the Department for Education to work with training providers to improve the information available on course content, including the specific skills, software platforms and techniques that will be taught.

## 5   Supporting young people, widening access, and narrowing the attainment gap

5.1.1   Efforts to improve maths, statistics, and data science education should aim to tackle inequalities; access to high quality qualifications and teaching in these subjects should be available for everyone. Efforts are needed to minimise the gender gap in take-up of these subjects and to ensure that the needs of the 'forgotten third', who require adequate maths, statistics and data skills to manage daily life, are met. Efforts should also be made to ensure that embracing digital technologies in maths education does not widen the digital divide and widen gaps in this way.

5.1.2   Statistics has poor subject identity – many students do not understand what the subject is and are underprepared and anxious when they come across statistics and data in the wide range of qualifications and job roles it is ubiquitous within. As students have poor understanding of the subject, this is a barrier to its selection for further study or work, and a barrier to more students gaining crucial statistical and data skills. We believe that allowing statistics to exist as a separate subject, from pre-16, would better familiarise students with the subject, including helping to overcome the access barrier to selecting statistics and data options for further study.

5.1.3   One option to achieve this could be to offer a renovated Statistics/Data GCSE alongside the (also renovated) Maths GCSE. Students could take both GCSEs (= two GCSEs), or could take a single combined GCSE option (= one GCSE), with core content covering both Maths and Statistics/Data. This would allow consolidation of statistical and data knowledge within a cohesive curriculum.