

Written evidence submitted by the Royal Society

House of Commons Education Select Committee inquiry

The impact of COVID-19 on education and children's services

1. Background: The Royal Society

The Royal Society is a Fellowship of many of the world's most eminent scientists and is the oldest scientific academy in the world. The Society's fundamental purpose is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

Our strategic priorities are to promote excellence in science; to support international collaboration; and to demonstrate the importance of science to everyone. It is for these reasons that the Society has a long-established schools education and policy programme to ensure that the UK maintains its status as a world-leading scientific nation, to encourage science, maths and computing education to 18, and to generate evidence and analysis to support a range of public policy decisions.

For some time, The Royal Society has been seeking a major review of the purpose and nature of the UK education systems, arising from a major study. In 2014, the Society published its Vision for science and mathematics education - an attempt to shape discussion around the 20-year future of school and college education.¹ The detailed report drew on a rich seam of perspectives, including a formal consultation and nine commissioned research studies. The report concludes that the changing nature of employment brought about by technological advance, along with societal and global challenges, require a radical rethink about the nature of our school education system. That is why the Society continues to call for a high-level review of education in all four UK nations, to ensure that all young people have a broad education in which their talents can be brought to the fore.

The COVID-19 pandemic has exposed the fragility of the current high stakes exam driven system, so now is a good time to do a fundamental review into how to ramp up the future resilience of both the educational system, and in doing so, support the resilience and adaptability of young people entering the work force to a highly uncertain future.

2. Royal Society work on COVID-19

Fellows of the Royal Society and individuals funded by the Society are contributing to the UK and global effort to tackle Coronavirus COVID-19. They are working with the UK Government as well as providing independent support for national and international efforts. In addition to research on the biology of the virus and therapies to combat it, on the development of

¹ [Vision for Science, Mathematics and Computing Education, The Royal Society, 2014](#)

vaccines, and on reviewing evidence to inform policy making, the Royal Society has convened a multidisciplinary external group - DELVE (Data Evaluation and Learning for Viral Epidemics) to support a data-driven approach to learning from the different approaches countries are taking to managing the pandemic. This effort has been discussed with and welcomed by Government, who have arranged for it to provide input through SAGE, its scientific advisory group for emergencies. One area of focus for DELVE has been consideration of decisions to close or re-open schools amidst the Covid-19 outbreak. We refer briefly to DELVE's work in this document, though the Society will submit the entire report and a separate headline summary.

Alongside DELVE is a related initiative RAMP (Rapid Assistance in Modelling the Pandemic) which aims to enhance modelling capacity in time to create a clearer understanding of different exit strategies from the current lockdown.

An emerging element of RAMP is a project to explore a process known as Structured Expert Judgement (SEJ), which is looking at more robust and accurate risk assessments of various proposals to relax and eventually end the lockdown. To model the potential consequences of re-opening primary schools, the team sought teachers with appropriate experience in school leadership. The Royal Society has linked some 35 teachers, mainly primary head teachers from our Schools Network and the Primary Science Teaching Trust.

3. Summary and recommendations

- The Education Select Committee should continue to monitor the 2020 results and the plans for the 2021 assessment series carefully, with a focus on ensuring that students from the most disadvantaged backgrounds are not further disadvantaged. The Royal Society recommends that option choices are included in the 2021 series to mitigate this.
- Practical work is integral to the study of science, and we recommend that wherever possible and safe to do so, students are required to undertake practical work as part of their science courses. The Royal Society recommends the Education Select Committee closely monitor Ofqual and the awarding bodies' decision making regarding practical work over the coming weeks and months.
- The mental health of young people and teachers must be an absolute priority as we begin to put together a 'new normal' in education. The Royal Society recommends significant funding is given to schools to help facilitate this.
- Covid-19 has exposed a number of fragilities in the current education system, but has also presented us with an opportunity to look beyond the pandemic, and to begin to create an education system fit for the future. The Royal Society continues to recommend a major review into the purpose and nature of the UK education systems, in order to build a system which truly prepares young people for their future.

4. Royal Society response

The Royal Society recognises that the current pandemic has generated a need for policy activity in three broad areas, though feels it is best placed to comment on specific areas of interest and expertise – notably on contingency planning and future resilience:

1. Mitigation – how to address in real time, the effect of the closure of schools and the challenge for children’s services.
2. Compensation – the nature of interventions that will be required to make up for educational losses, acknowledging that despite the valiant efforts of the school community and those working across children’s services, young people will not have had the same access to learning and support, leading to a deficit that will need addressing, while at the same time, the current circumstances will undoubtedly affect their wellbeing. The Structured Expert Judgement work of RAMP is a good example.
3. Building future resilience in the system – what has been learned from the effect of the pandemic on education and how this can help inform the nature of the UK’s education both to provide contingency to future crises, but also to capitalise on the beneficial outcomes.

The Royal Society has opted to comment on questions within the inquiry which best align with its education policy focus, drawing where possible from extant evidence base research studies and peer-reviewed reports, the perspectives of the Royal Society Education Committee members, the ‘Policy Alliance’ of scientific learned societies, the views of the Royal Society Advisory Committee on Mathematics Education (ACME) through its relevant contact groups and the Society’s own teacher network.

4.1 The effect of cancelling formal exams, including the fairness of qualifications awarded and pupils’ progression to the next stage of education or employment

The Royal Society broadly supports the decision to cancel formal exams in 2020 and the alternative approaches put in place. We nevertheless accept that these changes will inevitably produce inequities that will be experienced most by students who were already less advantaged and for whom examination success or failure will have arguably the greatest influence over their future opportunities. Covid-19 has further exposed the fragility of the high stakes qualifications system, and we call on Government, Ofqual and the awarding organisations to put in place a 3-5 year compensatory plan.

In April 2020, The Royal Society responded to the consultation request from Ofqual on its proposed plans to offer alternative methods for assessing students following the cancellations of GCSE and A-level exams. This included strongly endorsing the confidence expressed by Ofqual when seeking the professional judgement of teachers in the decision-making process and comment on how Ofqual could reduce bias and anomalies arising between Centres and across cohorts.

In July 2020, The Society offered a second response to Ofqual, this time in consideration of the regulator’s proposals for assessment in summer 2021 for which we offered the following recommendations for consideration:

- The need for mitigation and longer-term compensation for students from more disadvantaged backgrounds since evidence shows how the pandemic has exacerbated the pre-existing gulf between the most and least advantaged young people in our society
- option choices in examinations to address variability in teacher-led studies
- temporary measure to reduce examined content
- adjusting student outcomes in assessment using standardisation
- providing some reference resources in examinations
- centre-based assessment and delaying examinations

A further significant concern for the Society was the position of practical science in light of the challenges presented by social distancing and the importance of sterilising equipment. Experimentation in all its manifestations, forms the basis of scientific methodology, which is why it should remain a core element of how young people learn about science. Over recent years, there has been a narrative of the perceived value of practical learning arising out of a fairly narrow interpretation of the wider and longer-term impact. Along with the other scientific learned societies and the Association For Science Education, the Society considers that although we recognise the need for short-term changes to the examination practical endorsement to comply with potential safety risks, such changes need to be clearly signalled as temporary – and both DfE and Ofqual should make explicit their continuing commitment to assessed practical science as part of the narrative accompanying these arrangements.

Where practical work cannot take place, we wish to advocate the ‘next best’ option evidenced from interim findings from the Practical Assessment in School Science (PASS) project - led by the University of York Science Education Group and King’s College, London – which states that for students unable to complete a practical for themselves, those watching a teacher demonstration achieved significantly higher scores in GCSE exam questions on average than those watching a video or reading about it. Observation of lessons suggests the quality of purposeful discussion may be part of the reason for these differences; in teacher demonstrations students were given opportunities to test their thinking against the teacher’s expert view. This research is being funded by the Wellcome Trust, Gatsby Foundation and Royal Society.

4.2 Support for pupils and families during closures

- **Children’s and young people’s mental health and safety outside of the structure and oversight of in-person education**

The daily routine and safe environment of school is designed to provide young people with the security that forms the foundation of their future lives. This is especially important for those whose home lives may be more chaotic or who live in challenging economic or other circumstances. The relationship between emotional security, social development and cognitive processes linked to learning is well documented. The potential long-term effects of school closures, lockdown, social isolation, media and social media reportage, exposure to family illness and bereavement are likely to have psychological, emotional and economic costs. This

against a backdrop of low life satisfaction already documented amongst young people in the UK. The OECD PISA 2018 report, published in December 2019, reported a concerning finding regarding children's levels of life satisfaction. Only 53% of children in the UK reported feeling satisfied with their life, far below the 67% average across the other surveyed OECD nations.

Out of the 71 countries surveyed, the UK came 68th in terms of young people's life satisfaction, with 15-year-olds experiencing a 13 percentage point drop in life satisfaction since 2015 – a faster rate than any of the other countries.²

In 2019 the Royal Society published a commissioned study of parents' views on the current education system and how well it prepared their children for future work or study.³ Among several key findings, the report showed the concerns parents had about the stress and anxiety their children faced as a result of the current education system. In particular, parents pointed to examination assessment as a major cause, with the continuous cycle of assessment throughout secondary education characterised as a 'series of hurdles'. Parents found it impossible to separate education from the assessment system, and this clouded parents' ability to think about substantive parts of the education their children received.

Initial evidence seems to be clear that lockdown and remote learning are exacerbating mental health issues among young people. A survey of young people with existing mental health needs, carried out by Young Minds at the start of lockdown, found that 83% agreed that public health measures to combat coronavirus had made their mental health worse.⁴ A subsequent survey in May of school and college staff reiterated this, with 74% of respondents agreeing that schools being closed has had a negative impact on the mental health of young people.⁵

We have already detailed some of our thoughts and concerns about the impact of exam cancellations in 2020 in this response. The effects of these cancellations, and of the necessary closure of schools and colleges, will likely be felt by pupils for several years to come.

We believe that there should be a significant increase in funding within the next Spending Review specifically marked to fund a dedicated programme of professional mental health support for young people and teachers, special training for teachers to deal with anticipated additional professional demands of students' mental health and wellbeing issues, and the monitoring of mental health and wellbeing over a prolonged period, to be determined as a formula based around the period of abnormal school opening/closures, and the anticipated duration of detrimental effects.

4.4 The effect on disadvantaged groups, including the Department's approach to free school meals and the long-term impact on the most vulnerable groups (such as pupils with special educational needs and disabilities and children in need)

² [PISA 2018: What we have learned about children's life satisfaction – Schools Week, 5 December 2019](#)

³ [Parents' views on broadening school Education – Kantar Public for the Royal Society, 2019](#)

⁴ [Coronavirus: Impact on Young People with Mental Health Needs – Young Minds, 2020](#)

⁵ [Impact of Covid-19 on children and young people's mental health: results of survey with teachers and school staff – Young Minds, 2020](#)

The Education Select Committee will be aware of the particular risks that COVID-19 related disruptions have posed to the most disadvantaged students. We have highlighted earlier in this response some of the ways in which the least advantaged students will be adversely affected by exam cancellations, especially in STEM subjects. This includes our concern that students from disadvantaged communities are more likely to be awarded lower grades in science GCSE subjects than their more advantaged peers.

This is an extremely important issue and one that we hope the Education Select Committee will continue to raise with Ofqual – students who receive results that could impact on their progression must be properly supported through the autumn exam resit series.

In a recent Education Select Committee evidence session, Lee Elliot Major of the University of Exeter discussed the need for a systematic review of how the 2020 exam series results impact different groups of students, with an urgent need for clarity on how assessment will be delivered in 2021.

In particular, Professor Elliot Major highlighted that the assessment system used in 2020 following the cancellation of exams would not account for those students who often had ‘late surges’ during the examination period and often performed better than expected. This group of students is most often made up of boys, and those from disadvantaged backgrounds.

4.5 What contingency planning can be done to ensure the resilience of the sector in case of any future national emergency?

Covid-19 has exposed areas of fragility in our school education system, evident to many who wish to succeed but who do not fit the archetype around which the examination system has evolved to serve. Teacher attrition and poor access to the internet in schools with high levels of social disadvantage, complex home environments, and absence of family cultural capital throw into sharp relief the challenge posed by a high-stakes and unforgiving exam system. Children growing up in more advantaged circumstances have greater support around them, including visibility of the wide range of career opportunities available to them through their family and social networks.

A combination of these factors operate out of plain sight of the examination system to shape the intellectual, emotional and psychological development of young people, resulting in profound differences in personal resilience. This means that those individual young people, regardless of ability or talent, are less likely – even under normal circumstances to have the personal resilience to cope with low-level disruption and are widely predicted to fall further behind under this and any future national emergency.

The Royal Society strongly advocates the maintenance of high standards to ensure continuing value of our public examinations but recommends consideration of creative options to ensure fairness for all students within the current drive towards levelling up. The principal challenge is therefore how to ensure both fairness and rigour in our examination system. The Government, Ofqual and the awarding organisations should explore and cost responses to possible scenarios including: full school closure over a prolonged period, shorted punctuated school

closures over time, localised variations...etc. These might include introducing more frequent exams leading to a provisional grade that would enable students to continue to the next stage of their education. This would allow students to be assessed through modular exams most closely related to the missed content at a later date (though within a determined time period), meaning they would not be held back in their progress and/or need to re-sit the entire examination.

Though there is a possibility that COVID-19 might be contained so that it no longer presents a major global threat, the infection could persist at some significant level, resulting in disruption to the delivery of education on a continuous basis or periodically. Though it would be considered unrealistic for any national education system to move seamlessly from school delivery to home-schooling without disruption, current circumstances have exposed areas of fragility in the existing system, that highlight for example, how the absence of a broad education to age 18 experienced by all but the most advantaged students has more profound effects on those from more disadvantaged backgrounds. Equally the shift in practice from continuous and modular assessment to high-stakes synoptic testing has heightened the challenge for a valid and reliable substitute for the exam.

To equip people to work in an advanced economy, the Royal Society's ambition for science, computing and mathematics education has been to enable people to make informed choices and become empowered to shape scientific and technological developments. This has never been more urgent and more apparent than during the coronavirus crisis, where intelligent science-based decision making needs to be at the heart of all organisations' short and long-term crisis responses, and where science and innovation will be at the heart of economic recovery.

It should always be one of the key aims of the education system to produce well informed young people, who can engage in society and informed debate with confidence. COVID-19 has highlighted some of the ways we can make changes to education in order to ensure we are providing the very best foundation for young people in the UK.

The nature of work itself has been changing for many years now, with the concept of a 'job for life' no longer something young people will relate or aspire to. Young people at school now will need to switch jobs and often industries during their career, and we need an education system which provides a solid foundation across multiple disciplines to allow them this flexibility.

The Royal Society would like to take this opportunity to commend the teachers who have been working tirelessly through this pandemic to ensure that students still had access to learning whether in the classroom or online. The impact of covid-19 on teachers has been huge, and their commitment to delivering the best education possible to their students has been admirable.

Teachers from the Royal Society's Schools Network have told us of some of the challenges they expect to face from September, including managing the re-engagement of younger pupils, understanding and compensating for learning loss, particularly with students in

transition and exam years, the challenge of integrating NQTs who may not have been in a classroom environment for a number of months, and the general uncertainty around what the 'new normal' will be and when it will arrive. We hope that the Education Select Committee will make teachers' concerns a priority in the coming months.

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