LSG

The Learned Societies' Group on STEM Education

Professor Mark Priestley
Principal Investigator
Rapid Review of National Qualifications experience

September 2020

Dear Professor Priestley

Independent Rapid Review of National Qualifications Experience

I write to you as Chair of the Learned Societies' Group on Scottish STEM (Science, Technology, Engineering and Mathematics) Education (the LSG). The LSG brings together the learned societies and professional associations to identify and promote priorities for STEM education in Scotland. The LSG comprises the: Association for Science Education; British Computer Society, The Chartered Institute for IT; Edinburgh Mathematical Society; The Institution of Engineering and Technology; Institute of Physics; Royal Society of Biology; Royal Society of Chemistry; Royal Society of Edinburgh; and the Scottish Mathematical Council. While all of these organisations are individually active in their own right, the LSG provides a forum for them to come together to discuss and take action on shared interests and concerns.

We were pleased to learn that the alternative assessment model that was developed by SQA for 2020 will be subject to independent review with a view to learning lessons to inform future qualification awarding methodology. Although we recognise that SQA faced a monumental challenge in designing and implementing an alternative assessment model in a very short span of time in response to the COVID-19 pandemic, it is clear that the model lacked transparency and independent verification and led to considerable anxiety and confusion for a significant number of pupils. In the event that the 2021 exam diet must also be wholly or partially cancelled, it will be important to apply the lessons that were learned to ensure that any future alternative assessment models produce fair and credible results and renew public faith in the system. The review might also reflect on the extent to which the 2020 model adhered to the three SQA core principles of fairness to all learners; safe and secure certification; and maintaining the integrity and credibility of the qualifications system, and how any future models might better reflect them.

Below we have summarised our main observations with respect to the 2020 alternative assessment model and impending review. These have been organised according to topic for ease of reading. We

appreciate that the review is being conducted rapidly in light of the urgency of the issues it seeks to explore and we hope our comments will be useful as the review team undertakes its analysis.

Statistical methodologies

1. Concerns have been raised about the statistical methodologies on which the alternative assessment model was based, most notably by the Royal Statistical Society.[1] We agree that these methodologies warrant independent and expert scrutiny, particularly if they are to serve as the basis for any future alternative assessment models that may prove necessary. You indicate that an evaluation and assessment of the design of the moderation model lies outwith the remit of this review. While we appreciate that it would be very challenging to undertake such an evaluation within the timeframe of the review, there is a need to generate a detailed understanding of the methodological approach used in order to plan improvements for the future.

2. Had SQA provided stakeholders with early sight of its proposed methodologies as had been recommended by the Scottish Parliament's Education and Skills Committee, this would have provided an opportunity to consider the extent to which they were fit-for-purpose and to put in place measures to address any unintended consequences. As it was, detailed information on SQA methodology only became available on Results Day and at that point it was impossible to proactively address any issues. As SQA considers contingency plans for the 2021 exam diet, we would hope that they seek to involve external expertise from the outset so that any future models can be collaboratively developed and independently verified.

Objective evidence

3. We note the remit's commitment to consider the "perceived rigour in the evidence base for making estimates." It would appear to us that one of the key shortcomings of the alternative assessment model was that it was difficult to determine the extent to which objective evidence of pupil performance influenced teacher estimates. Grades were based on teacher estimates and moderated against a centre's historic performance and expected distributions. Although this produced results that were often acceptable at an aggregate level, it concealed significant discrepancies at the individual level which might have been mitigated against had more objective evidence been made available to teachers or had it been afforded more prominence in the model.

4. The accuracy of teacher estimates is heavily predicated on teacher experience, such that new teachers may be less confident in their ability to make judgments on student achievement. Additionally, there is no reference standard for different grades across different subjects, meaning that there is nothing to which estimates can be reliably compared. Further, it can be challenging for teachers to assign pupils to a rank order, as rankings are likely to become more nuanced towards the middle and therefore harder to ascertain. It would be beneficial to ensure that teachers at all stages of their careers have access to professional advice and support to improve the accuracy of their estimates. This includes training in how to avoid or mitigate unconscious bias, which is another way in which estimated grades can potentially be distorted.

5. Centre performance can also be variable and influenced by various factors, meaning that it is not always an appropriate check of estimate validity. Indeed, for subjects and courses with low

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[1] https://rss.org.uk/RSS/media/File-library/News/2020/06082020-RSS-EPAG-statement-on-grade-adjustment-2020-exams-in-UK-FINAL.pdf

uptake, such as most Advanced Highers, the variability in cohort size makes historical data a particularly poor predictor of individual pupil performance in any given year.

Progression

6. While the national focus has been on the immediate repercussions of the moderation process and the subsequent reinstatement of original teacher estimates, some impacts of the alternative assessment model may only become apparent over the longer term. For example, although universities agreed to offer additional places to account for newly eligible candidates as well as those admitted on the basis of initial estimates, it was inevitably the case that certain courses had reached maximum capacity by the time this announcement was made, forcing some students to abandon their initial course selections and pursue other options. The abrupt about-turn from moderated grades to teacher estimates may have also affected graduate apprentices who already had assured placements. This review might therefore recommend that a subsequent review be undertaken of student experiences with progression, including to higher and further education. This could include an investigation of whether any observed effects were more pronounced among those pursuing STEM subjects, which tend to observe stricter caps on enrolment due to the capacity issues posed by practical laboratory work. It could be the case that some students may have had their intended academic and career trajectories altered, which could have implications for existing and potential future workforce shortages across certain STEM sectors.

7. It also bears mentioning that some students were likely awarded higher grades than they would have earned had they sat traditional exams. Some of these students may have been allowed to progress to subsequent education, training, and career destinations for which they are ill-prepared in practice and they may find themselves struggling to cope with these new expectations. There is a need to consider the additional support that these students may require as they navigate the next stages of their learning and professional journeys.

8. Although you specify that analysing the 2020 data set is beyond the remit of this review, we stress that it will be important for SQA to release more detailed equalities data (e.g. entries and attainment with respect to gender and ethnic groups) as soon as possible so that any evidence of systematic bias can be revealed and appropriately addressed.

I hope that the above has been useful in setting out the LSG's recommendations for the rapid review of the 2020 qualifications experience. We would be pleased to discuss our views further should you consider that productive. To this end, we would be grateful if you could follow up with the LSG's secretary, Daria Tuhtar, dtuhtar@therse.org.uk, 0131 240 5006.
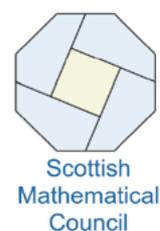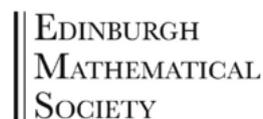
Yours sincerely,

Professor Maggie Cusack FRSE
Chair of the Learned Societies' Group

CC Mr John Swinney MSP, Deputy First Minister and Cabinet Secretary for Education and Skills

CC Scottish Parliament's Education and Skills Committee